

# SUPPLEMENT.

## The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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No. 2403.—VOL. LI.

LONDON, SATURDAY, SEPTEMBER 10, 1881.

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### "Kainotomon" Rock Drill

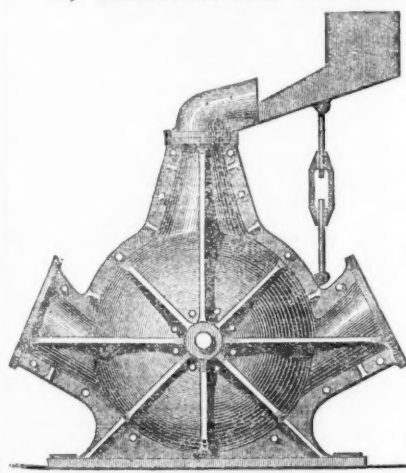
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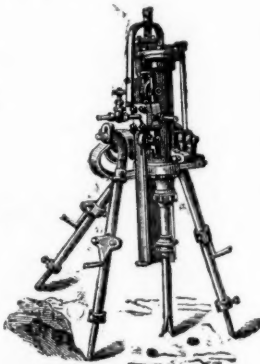
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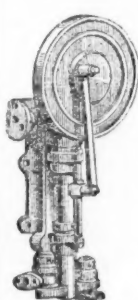
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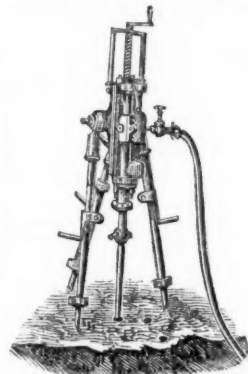
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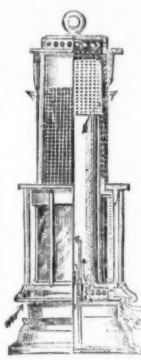
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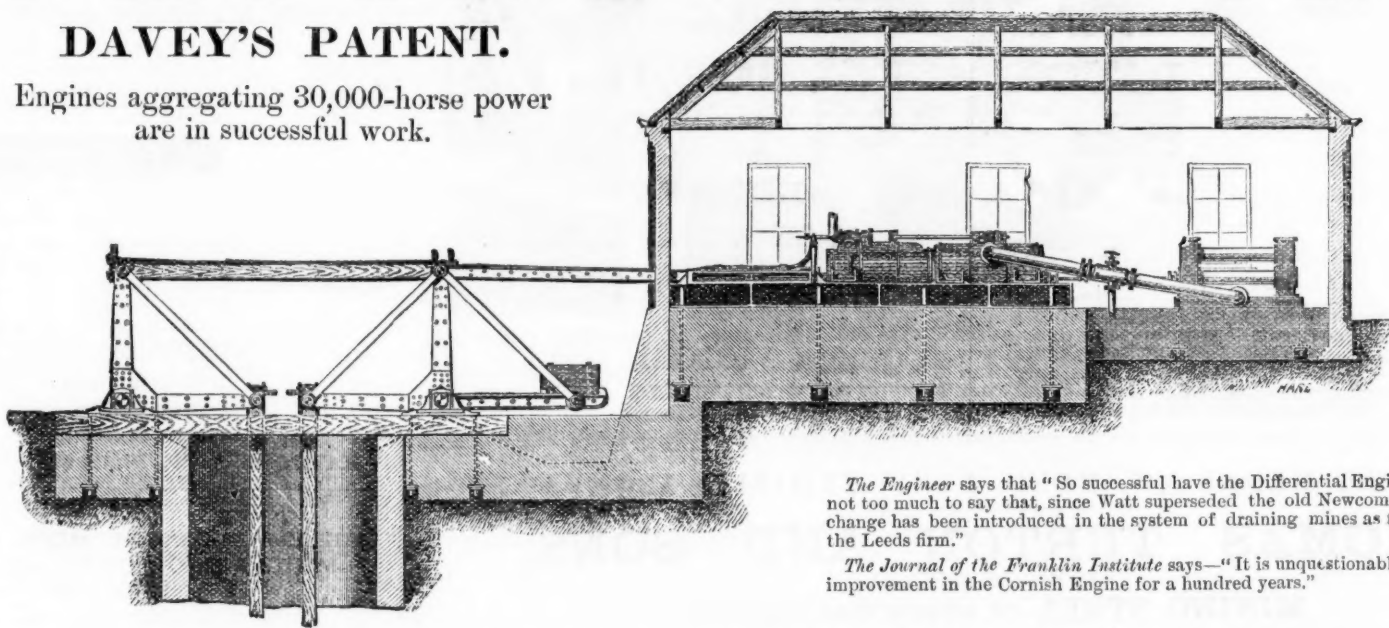
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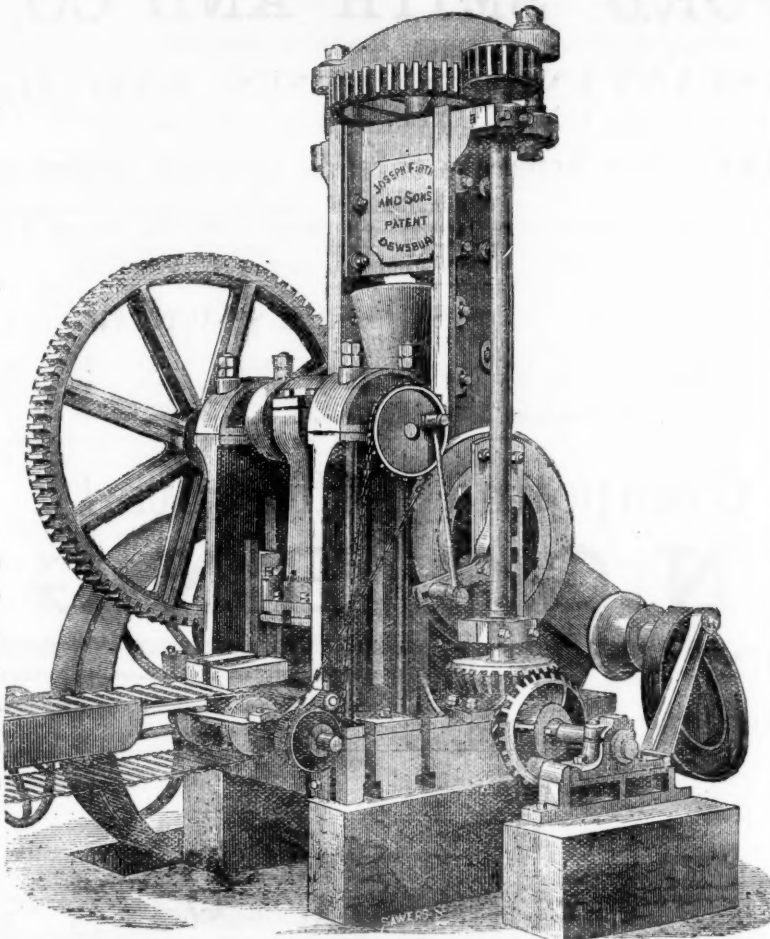
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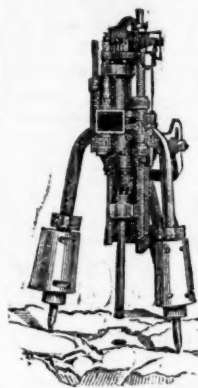
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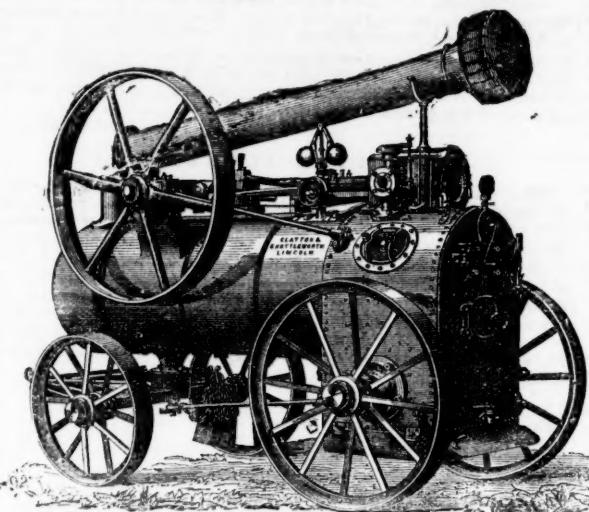
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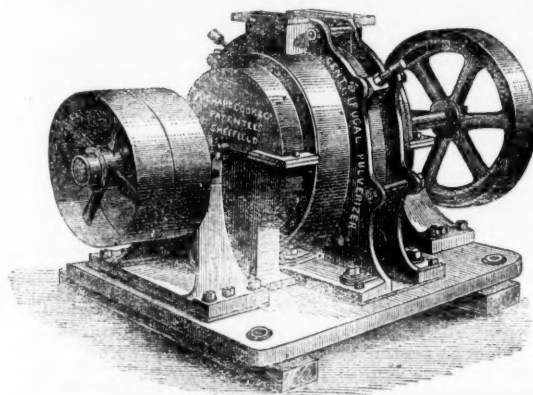
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STAMP END WORKS, LINCOLN, & 78, LOMBARD STREET, LONDON.

## LUCOPS' Patent Centrifugal Pulveriser,

(Two tons per hour with 5 horse-power actual.)



For reducing to an impalpable powder, or to any requisite degree of fineness, all materials capable of being thus treated. CEMENT, CHEMICALS, GRAIN, COAL, COLOURS, PHOSPHATES, LIME, COPPER, TIN, ZINC, and other Ores with rapidity, completeness, and perfect uniformity.

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This mill consists of a circular iron casing, the section being elliptical in form, and is fixed vertically on a firm bed or foundation plate, a shaft runs through the centre of the casing on which is keyed a series of arms, in the extremities of which revolve two or more slightly oblong iron rollers, which, when put in motion, fly off from the centre and run upon the interior periphery of the casing, and by centrifugal force crush and pulverise the article under treatment.

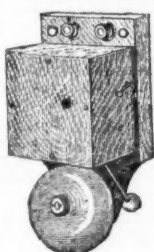
The effect produced by this system is most extraordinary in its practical results, the power required is small in consequence of the comparative absence of friction from the working parts of the mill, the combined results of the rolling action of the crushers and their impact by centrifugal force on the material, being the same in kind, but in degree far exceeding that of edge runners, the sides of the casing are formed as open wire sieves of the degree of fineness required, and a series of propelling blades attached to and revolving with the central shaft drive the material under treatment through the sieves as it is pulverised; by this arrangement the degree of fineness can with certainty be arrived at from coarse to extreme fine, and that with uniformity.

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AND OTHER TELEGRAPHIC APPARATUS FOR MINES, &c.



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First Prize - - - Sydney, 1879.  
Prize Medal - - - Melbourne, 1881.

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## MANCHESTER WIRE WORKS.

NEAR VICTORIA STATION, MANCHESTER.

(ESTABLISHED 1790).

**JOHN STANLIAR AND CO.,**

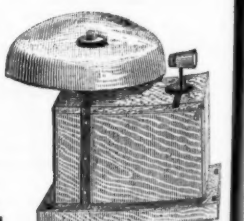
Manufacturers by STEAM POWER of all kinds of Wire Web, EXTRA TREBLE STRONG for

LEAD AND COPPER MINES.

Jigger Bottoms and Cylinder Covers woven ANY WIDTH, in Iron, Steel, Brass, or Copper

EXTRA STRONG PERFORATED ZINC AND COPPER RIDDLES AND SIEVES

Shipping Orders Executed with the Greatest Dispatch.





## Original Correspondence.

## TECHNICAL EDUCATION FOR MINERS.

The Royal School of Mines may be regarded as defunct, and it may be hoped that the extravagantly heavy amount which annually appears in the estimates upon the pretence that it is paid for the advantage of miners and the mining industry will no longer find a place in the Parliamentary Votes. Henceforth the School of Mines is merely an affiliated branch of the Normal School of Science which has itself but seven professors, and one instructor of lower rank—a teaching staff which would be a disgrace to any of our public schools and to many private educational establishments. Compared with King's College, London, Owen's College, Manchester, the College of Science at Leeds, or the College of Physical Science at Newcastle, the teaching power of the Normal School of Mines at South Kensington is unworthy of mention, and it may safely be said that it would be difficult to find in either France or Germany a technical school connected with the Government of the country so utterly insignificant. That the Royal School of Mines has never been appreciated by the mining community, nor by the public, must be admitted; indeed, this is evidenced by the very limited number of students who have attended the courses of lectures, and by the small importance attached by the public to the possession of the associateship as an indication of merit or utility. Even the Duke of Cornwall scholarships, which might have been considered as forming some connection between mining and the School, no longer appears in the prospectus, so that the sooner the name Royal School of Mines, and all connected with it, is abandoned the more economic it will be for the country, and the more beneficial it will be to the mining community.

Precisely as the graduate of the London University is wanting in all the essential characteristics of graduates of universities, where residence is necessary to graduation, so the *diplômés* of the Royal School of Mines have been wanting in all the essential characteristics of the miner. There has in both cases been that absence of friction with men of greater experience which gives the indiscribable qualifications of the gentleman and of the miner respectively. But it must not be supposed that in suggesting the total abandonment of the Royal School of Mines and its accessories the importance of the subjects which have been taught there, and which are henceforward to be taught, at the Normal School of Mines, is ignored all that is contended is that the professorships—numerous enough to be very costly, but not sufficiently numerous to give any status to the school—should be abolished, reliance being placed on the twenty-four professional examinerships, for science to supply certificates to those who aspire to earn them. It is obvious that as a teaching body the Normal School of Science can have no more claim to an existence than had the Royal School of Mines which it supersedes, and this being so it is an absolute cruelty to require students to study at South Kensington subjects which could be, and in fact are, better taught in the neighbourhood of the mines and of the workshops where the knowledge of them is afterwards to be utilised. Objectionable as is the paper-university system, it cannot be denied that the Normal School of Science system, which practically demands residence where residence is valueless to the student, is infinitely more so.

The Normal School of Science may be regarded as the Upper Division of the Science and Art Classes identified with the May examinations, which has already certificated a large number of conceited ignoramus who have thereafter been unable to earn an honest livelihood, but who have, nevertheless, satisfied the examiners of the Education Department; yet it is distinctly stated that students are to be admitted to the Normal School "on the payment of fees fixed at a scale sufficiently high to prevent undue competition with institutions which do not receive State aid." Now, it would have been supposed that if it were necessary for the State to pay teachers at all the teaching should be for the benefit of those who would otherwise be unable to obtain it. The prospectus states that the instruction in the Normal School is arranged in such a manner as to give the students a thorough training in the general principles of Science, followed by advanced instruction in one or more special branches of Science.

The associateship is granted in certain divisions or lines of study. Students who go through any one of the prescribed courses of instruction and pass the necessary examinations receive a certificate of associateship of the Normal School, or of the Royal School of Mines.

Both students who are not candidates for the associateship are permitted to take up the course of instruction in one or more special branches of science, and on passing the examination receive a certificate to that effect. The associateship of the Normal School of Science is given in mechanics, physics, chemistry, biology, geology, and agriculture; and the associateship of the Royal School of Mines in metallurgy and mining. During the first two years the course of instruction is the same for all divisions, but in the final year it is specialised, as far as it can be specialised, with seven teachers to instruct students connected with the, perhaps, 700 separate industries carried on in this country.

The manner in which this specialising process is carried out is at once suggestive and instructive. To produce a geologist the Normal School of Science prescribes three doses of biology and one of botany, whilst the agriculturalist is to take three doses of biology, one of botany, and one of mechanics for the third year's course. The biological doses appear to be of two kinds, differently subdivided. The infusion of biology into everything reminds one of the French professor, strong on cyanogen, who being asked to examine in astronomy for a colleague asked—What colour is the sky sometimes? Blue. What does blue remind you of? Of cyanogen, does it not? Yes. The examination was continued exclusively with reference to his own researches about cyanogen. The fees for the first two years amount to 75*l.*, and for the remainder of the course for the associateship they vary from 30*l.* to 40*l.* more, so that for all miners to whom the curriculum might possibly be useful the school is practically closed.

It would appear, then, that the enormous cost which the maintenance of the Normal School of Science involves is incurred solely for the benefit of the prizemen of the Science and Art classes, and it is admitted that successful cramming, rather than even average intelligence, is the passport to a prize. There are 12 Royal Exhibitions to the Normal School of Science and the Royal School of Mines. They are of the value of 50*l.* per annum each, and are tenable during the course for the associateship, that is to say, for three years, except in the case of students entering for the associateship in agriculture and geology, when they are tenable for three years and a-half. Three or four exhibitions are, therefore, generally open for competition each year. They are competed for at the May examinations of the Science and Art Department, and are held from year to year, on the condition that the holder attends the courses regularly during those years, complies with all the rules laid down for his guidance, and passes the examinations required for the associateship. The exhibitions entitle the holders to free admission to the lectures and the laboratories. There are also six free studentships awarded annually, under the same rules and conditions as the Royal Exhibitions. They give the student free admission to the lectures and laboratories for three or three and a-half years, as the case may be. About 50 teachers and students in science classes, who intend to become science teachers, are admitted free to the sessional course of instruction at the Normal School. They receive second-class railway fare to and from London, and a maintenance allowance of 21*s.* a week while there. Free instruction is given to the local exhibitors. The rules for the creation of local exhibitions, to which the locality contributes 25*l.* and the State 25*l.*, are to be found in the Science Directory. Four Royal Scholarships, of 15*l.* each, are given to the students who have gained the greatest aggregate of marks in the examinations of the first year; and two scholarships of 25*l.* to those pupils who have gained the greatest aggregate of marks in the examinations of the first two years. And, lastly, there are the Edward Forbes medal and book prize, for biology; the Murchison medal and prize, for geology; the Tyndal prize, for physics; the De la Beche medal, for mining; and the Bessemer medal, for metallurgy. As

an examining body the Normal School of Science may prove useful and successful; as a teaching body it has nothing to recommend it, and will inevitably come to as ignoble an end as the institution it replaces.

## THE BANKS OF ENGLAND AND FRANCE.

SIR,—In June 1876 there was in the banks of England and France 743 tons of gold, or 111,413,279*l.* value. Now this was not surprising as New Zealand exported from 1862 to 1875, 8,025,676 ozs., or 246 tons, of 23 carat gold, value 30,820,137*l.*, or \$151,271,293 gold. New South Wales exported from 1851 to 1874, 8,205,232,598 ozs., value 31,536,246*l.* 10*s.* 6*d.* Can any of your readers tell us what is the position of things now?—*Forest Hill, Sept. 6.*

R. GEORGE SMITH.

## QUICKSILVER.

SIR,—With reference to Mr. J. B. Randol's desire to obtain data of the statistical position of Quicksilver—presumably for the purpose to enable him as manager of the Quicksilver (New Almaden) Mining Company to solve the problem of buyers being able to supply their wants at prices barely remunerative to producers, I have pleasure in submitting the appended particulars for the information of any interested in this article, being convinced that the limit of the declension is now reached, as the records for 30 years past afford only one instance of a depreciation below the present market value, 6*l.* 5*s.*, and that in the year 1879, one long to be remembered as disastrous alike in agriculture and commerce:—

Unassisted like the agriculture and commerce.																		
Highest.				Lowest.				Highest.				Lowest.						
£ s. d.				£ s. d.				£ s. d.				£ s. d.						
1850	...	15	0	0	...	13	2	6	.....	1861	...	7	0	0	...	7	0	0
1851	...	13	15	0	...	12	5	6	.....	1862	...	7	0	0	...	7	0	0
1852	...	11	10	0	...	9	7	6	.....	1863	...	7	0	0	...	7	0	0
1853	...	8	15	0	...	8	2	6	.....	1864	...	9	0	0	...	7	10	0
1854	...	7	15	0	...	7	5	0	.....	1865	...	8	0	0	...	7	17	6
1855	...	6	17	6	...	6	10	0	.....	1866	...	8	0	0	...	6	17	6
1856	...	6	10	0	...	6	10	0	.....	1867	...	7	6	0	...	6	16	0
1857	...	6	10	0	...	6	10	0	.....	1868	...	6	17	0	...	6	16	0
1858	...	7	10	0	...	7	5	0	.....	1869	...	6	17	0	...	6	16	0
1859	...	7	5	0	...	7	0	0	.....	1870	...	10	0	0	...	6	16	0
1860	...	7	0	0	...	7	0	0	.....									

In giving a synopsis of prices for the past decade a more comprehensive conception of their fluctuation will be conveyed by analysing at the same time the output for the various years:—

Spanish and Italian.	Austrian.	California.	Total.	Highest.	Lowest.
Bottles.	Bottles.	Bottles.	Bottles.	£ s. d.	£ s. d.
1871 ... 35,700 ... 12,000 ... 31,500 ... 79,200 ... 12 0 ... 9 15 0					
1872 ... 37,700 ... 13,200 ... 30,000 ... 80,900 ... 13 0 ... 10 0 0					
1873 ... 35,900 ... 12,400 ... 28,500 ... 76,800 ... 20 0 ... 12 10 0					
1874 ... 33,400 ... 12,500 ... 34,000 ... 79,900 ... 26 0 ... 18 10 0					
1875 ... 44,400 ... 12,500 ... 53,500 ... 110,400 ... 22 0 ... 9 10 0					
1876 ... 41,900 ... 12,500 ... 74,000 ... 127,400 ... 11 11 ... 7 17 6					
1877 ... 41,900 ... 13,000 ... 78,000 ... 132,900 ... 9 10 ... 7 2 6					
1878 ... 41,900 ... 12,000 ... 63,000 ... 119,900 ... 7 5 ... 6 7 6					
1879 ... 45,500 ... 14,000 ... 74,000 ... 133,500 ... 8 15 ... 5 17 6					
1880 ... 48,200 ... 12,600 ... 55,000 ... 115,600 ... 7 15 ... 6 7 6					

Now having dealt in detail with the production, it is necessary to study the consumption, a somewhat more difficult computation to arrive at, authorities on the matter estimating the present demand at figures varying as per tabulation:—

Europe (excluding England) ...	£30,000 to £35,000 per annum.
England ...	12,000 " 15,000 "
California ...	8,000 " 12,000 "
Mexico and West Coast ...	20,000 " 25,500 "
China ...	25,000 " 30,000 "
New York, &c. ...	10,000 " 12,000 "
Sundries ...	2,000 " 3,000 "

£107,000 £132,000

or dealing with carefully collected figures, the average consumption, dividing the past ten years into equal periods, is placed at for—

1871 to 1875. 1876 to 1880.

85,000 per annum ... 120,000 per annum, or increase of 41 p. cent.

This increase in the consumption, 1876—80, is the more noteworthy when one takes into consideration the almost unprecedented commercial and agricultural depression and stagnation during the latter period, intensified by an aversion to all new enterprises; recently a complete revulsion of this antipathy has been witnessed, the eagerness to develop Indian mining being of such a character that 38 companies in this region alone are engaged in extracting golden treasure from its impregnated quartz. South and North America, with Western Africa, have also augmented the total with no mean contingent for the pursuit of this metal. Therefore it is not sanguine to anticipate a considerable accession of orders from these virgin sources. To illustrate the probable consequences of an increased demand the consumption for the present year can be placed at 5000 bottles below the average, or say at 115,000 for the year, thus presuming the output for 1881 does not exceed 1880, absorbing current production, leaving no margin for the requirements of recent enterprises now rapidly completing the erection of their crushing machinery. Should the pioneer Indian companies show favourable results in the preliminary crushings which are on the point of and taking place the position of the market will be vastly changed.

Writing in the Journal—June, July—I foreshadowed my opinion of this market's prospects on the development of Indian properties. I now confirm all written, only regretting the lethargy of those officials whose torpidity has prevented this industry being established on a sounder basis ere this.

Rogdon, Sept. 6.

## NOUVEAU MONDE MINE.

SIR,—It can hardly be reasonable to attribute the depression in the shares of the Nouveau Monde Company solely to the absence of authentic reports. Though, no doubt, in their anxiety not to put before the public any information that is not in every way borne out by fact, the managers of this mine have in my opinion erred on the side of over caution. However it is a good fault, if fault it be, and one that will readily admit of repair. Therefore, thinking shareholders cannot but feel that there must be adverse influences at work either from persons who are desirous of acquiring shares in an admittedly good mine at the lowest prices, or possibly from "bears" who being out of shares are willing to use any means in their power to cover themselves before the inevitable rise comes—as come it will, and that before many weeks, or possibly days, elapse. Holders will, therefore, do well not to allow themselves to be frightened out of their shares on any pretence, as by the exercise of a very little more patience they will most certainly see a handsome profit; and I will endeavour, as shortly as possible, to give good reasons for drawing such a conclusion.

In the early part of last year the shares rose to 2*l.* 12*s.* solely on the prospect of acquiring the Nacupai Mine, and now with everything most favourably settled they are scarcely higher in price than they were 12 months ago, when all negotiations for obtaining the necessary capital were broken off, and it was feared the golden opportunity would pass for ever from their power. We all know this danger was at last successfully averted, but it cannot be generally known by what energy, influence, and tact the many difficulties were overcome. And having this energy opposed to them the detractors of the mine have constantly been obliged to shift their points of attack as each accusation was controverted. They said the capital could not be found; that there was no fuel at the mines; that labour was unobtainable; that the title was not good; and, lastly, that Mr. Lambert's encouraging report was only printed to assist in the issue of further capital.

But what are the facts? They are as follows:—

- 1.—The capital has all been found and deposited in the London and South-Western Bank long before Mr. Lambert came to England, and there is an ample reserve for working expenses.
- 2.—The mine is now entirely paid for.
- 3.—The title is indisputable, and has been confirmed by the highest court in that country.
- 4.—Labour is abundant and cheap.

5.—Fuel is plentiful.

6.—The machinery is good in kind and quantity, and is, moreover, reported by the manager to be in much better order than he expected.

7.—The mine is opened up in a masterly way, and returns can consequently be made much sooner than from those companies, many of whose shares are at a high premium, who have only virgin ground upon which to commence a mine; and more than all this, not only is there a stock of pay ore on the bank, but one of our mines—the Corina—does not even require pumping, but has quartz containing visible gold ready for stopping at comparatively shallow levels, and on this they are now at work, and any day may bring us information as to the number of ounces yielded per ton of quartz.

The delay in the transmission of news is accounted for by the difficulty of communication, as the nearest telegraph station to the mine is Trinidad, whence communications are forwarded, or where they are received by steamer plying each way only once a fortnight. In addition to the above facts, all of which can be readily confirmed. We have one property adjoining the richest parts of Potosí and the Mopocopa, which so many financiers and others are desirous of acquiring that if he thought well to dispose of it the *gerant* could obtain such a price as would suffice to pay a most handsome bonus to the shareholders, and even without this if my brother shareholders will only wait a little while longer. Those most able to judge are confident they will not only not wish to part with their shares, but will only be too anxious to see how many they can retain for the sake of the large and regular dividends they most surely will receive.

London, Sept. 8.

A. C. B. (A Shareholder).

## INDIAN KINGSTON AND SANDHURST GOLD MINING COMPANY.

SIR,—Knowing the Journal is always open to aggrieved shareholders, I venture to ease my mind of a few thoughts that have occurred to me since my attendance at the statutory meeting of the above company, held this day. At that meeting it was pointed out that a clause existed in the Articles of Association whereby shareholders holding 100 shares and under have no voting powers whatever. We were told that the board were willing to alter this, but they would prefer not doing so at the present, as it would entail some expense in printing. I ask is this common justice to a large body of gentlemen who have placed money in the hands of a few? And I would urge strongly the shareholders taking immediate action to have this arbitrary clause erased, so that they may be in a position to protect their interests.

Did the directors consider expenses when they sent out their elaborate proxy papers, all fully stamped, even to those shareholders whom they acknowledge had not a vote? I would like to know the total number of shareholders on the register, and how many of these are holders of 100 shares and under? It was also pointed out that this interesting document provided remuneration to the directors at the rate of 1000*l.* per annum, with an addition of 100*l.* for every 1 per cent. paid in dividends above 10 per cent. I do not object to the addition, but I strongly object to a board receiving so handsome a remuneration during the time a company is comparatively prospecting, when all is going out and nothing coming in. These Articles of Association appear to me very one-sided, and I would urge the shareholders to see to this also.

The next thing we were told was that the purchase-money for the property had been paid, as the transfer had been made on this side, and the deeds had been sent out for registration in India. I believe it is a fact that no property is legally transferred in India until it is registered. If this is so, how comes it that our directors have paid the purchase-money before the property is legally in their hands, for until it is registered the title is incomplete, and we have nothing for our money? As to the syndicate who are wishful to take up the balance of the unissued shares, will they do this at par, if not at what discount? It must be borne in mind that the shares are already at a heavy discount.—*Sept. 6.*

A SHAREHOLDER.

## THE RICHMOND CONSOLIDATED.

SIR,—Your correspondent, "A Late Shareholder," must be grievously disappointed that his vapoury communication induced a result so totally opposite to that intended. I hope that for the sake of his bank account he re-purchased the shares he never held, yet so recklessly sold, and that he has not again been caught in the trap to be liberated from which has cost him so dearly upon many previous occasions. "A Late Shareholder" may be surprised, if not delighted, to hear that further valuable discoveries are being made, and just at those pioneer points where he lamented discoveries had not been made.

"A Late Shareholder" may not hail with satisfaction the fact that the quartzite encountered in sinking the perpendicular shaft has been used for flux; that quartzite at this great depth—1100 ft.—is the most encouraging sign ever met with in the mine, pointing, as it certainly does, to the permanence of the lode. Apart from the discoveries now being rapidly opened out, there still remains in the upper levels the enormous bulk of seven acres of rich ore, or, in other words, an assurance of quarterly dividends to its shareholders for years to come.

Sept. 7.

A NON-SPECULATING SHAREHOLDER.

## RICHMOND CONSOLIDATED MINING COMPANY.

SIR,—A few days since I was discussing with a gentleman of great commercial and financial experience the letters which have appeared in the Journal, signed by "Former Shareholders," when he somewhat abruptly remarked—"You cannot suppose that those letters were written by former *bona fide* shareholders? Why should such persons, who have admittedly severed their connection with the company, go out of their way to enlighten the public with their reasons for parting with shares, and spend their time in writing letters about matters which, by their own showing, have ceased to concern them. There are few such philanthropists in the world. The chances are that those letters have been written by 'bears,' who wish for their own purposes to temporarily depreciate a property which is known to be one of the most genuine and remunerative investments in the market." He made other remarks to the same effect, which singularly chimed in with my own views; since I had heard from parties who should know something about it that persistent attempts have been made during the past few months to drive the shares down, and that these organised attacks are made with more reckless energy just before anything good is about to transpire in connection with the property. In illustration of this statement I cite a case:—In May last the shares were "rushed" down just previously to the annual meeting and Chairman's statement respecting the satisfactory present and splendid future of the company, when a bonus of 1*l.* per share, in addition to the usual quarterly dividend of 10*s.* was declared.

2.—The best way to counteract any reckless or unscrupulous attacks on a magnificent property is for all *bona fide* shareholders in that property to add 5 or 10 per cent. to the number of their shares, and insist upon delivery of the certificates within the time prescribed by the rules of the Stock Exchange. For this purpose they should employ only stockbrokers of good repute and standing, who will faithfully attend to their clients' interests in the matter of delivery of certificates at the appointed time. Failing delivery shares must be bought in, and the professional "bears" will be cornered, as they richly deserve to be.

3.—On good authority I venture to make the following statements, which go far to justify my previous remarks:—

(A.)—That the directors of the Richmond Consolidated Mining Company are not acquainted with any circumstances or reasons to account for a fall in the price of shares.

(B.)—That very few shares pass through the company's office for transfer; and that, therefore, if *bona fide* purchases be made in the way suggested in paragraph 2, and delivery of certificates be insisted upon, shares will, instead of being depressed, soon be quoted at their legitimate value.

(C.)—That the fact that the furnaces would have to be closed for two months was intimated in the circular which was sent to every shareholder in May last, and was further alluded to at the annual meeting. Therefore, it is unreasonable to suppose that any *bona fide*



former shareholder should urge—at the end of August—this circumstance as a reason for parting with shares, more especially as it is well known that good dividends had been paid in other years, when the furnaces had been closed for repairs, &c.

(D.)—That there are ample "reserves of ore" in sight, sufficient to warrant payment of many a 10s. quarterly dividend, and that there are confident expectations of further great discoveries of ore being made at an early date.

(E.)—That it will be quite time enough for genuine investors to part with shares when the Albion Company shall have successfully appealed against the late adverse decision (a very improbable contingency). Meanwhile, looking to all that they know about the present position and future prospects of the company, let shareholders "sit tight," add to rather than part with shares, and so decline to play into the hands of "bears" or "wreckers."

I see that one gentleman has shown his confidence in the company's future and in the management of the directors (who are by far too honourable a body of men to have misled their shareholders at the last meeting) by lately adding 60 shares to his former holding. I hope that he will insist upon punctual delivery of certificates. Hitherto I have found difficulty in obtaining my certificates; but in all future purchases I shall put in practice the advice I have given to others.

The "faithful" will realise before long that the Richmond Consolidated is still the finest mineral property in the world.

Brighton, Sept. 6.

HOLDFAST.

#### RICHMOND CONSOLIDATED MINING COMPANY.

SIR,—I have been much amused, as a holder of nearly 200 shares in the Richmond Consolidated Mining Company, to read the reasons alleged in the Journal by "Another Late Shareholder" for parting with his interest in this company. He states that, according to his calculation, the profits on the first half-year (during seven weeks of which smelting was suspended) will be "only 70,000*l.*"—in other words, because his shares are likely to yield him only 16 per cent. on their present market value he has sold them. I hope he will not consider it an impertinence on my part if I enquire in what investment he has placed the money which he has realised by their sale? For myself I know of no investment at present yielding as large a rate of profit as my holding in this mine; but I am open to conviction, and if your correspondent will let me know of the El Dorado upon which he has alighted I shall be glad to have the opportunity of participating in its benefits, but it must be distinctly understood before I invest that the prospects of dividend must be better than those which "Another Late Shareholder" must see from his own calculation are likely to be derived from my present investment. On reference to the general balance-sheet I find that the profits of the mine for the year ending Feb. 28, 1881, were 236,042*l.*, or sufficient to pay a dividend of 4*l.* per share, which would have absorbed 216,000*l.*, leaving 20,000*l.* to be carried to a reserve fund. The directors divided 3*l.* 7s. 6d. per share, and carried 25,000*l.* to the reserve fund, now amounting to 75,000*l.* Your correspondent calculates a profit of 70,000*l.* on the working of the current half-year, during seven weeks of which smelting has been suspended; and for the remaining 26 weeks, adopting the same low estimate, I calculate the result will be a profit of 95,000*l.* for the second half-year, or 165,000*l.* for the year, leaving 3*l.* per share to be divided amongst 54,000 shares, or at the rate of over 16 per cent. per annum on the present market value of the shares. I am of opinion that when the share market has recovered from its periodic autumnal depression these shares will not stand long at about 16*l.*, but will be saleable at a great advance, which would be fully justified by their intrinsic value. I know of no investment, mining or otherwise, which appears to me to have in it more solid elements of success than the Richmond Mine, and I speak the sentiments of those who are well acquainted with its history and its resources when I say that a long and prosperous future of good dividends from the mine can be confidently relied upon.

A FIRM HOLDER.

#### EUREKA (NEVADA) MINING DISTRICT.

SIR,—I have the pleasure to enclose my usual budget of news received from this locality:—

The town is full of people desiring contracts on the new railroad. Another party of surveyors went out on the line of the new railroad yesterday. Eureka Consolidated yesterday declared its regular monthly dividend of 50 c. per share, making the grand total dividends of the mine \$4,765,000.

Twenty-two men are constantly employed in quarrying out rock for the foundation of the Eureka Consolidated new hoisting-works.

E. H. Rose yesterday commenced shipping ore from the Woodchopper Mine to the Eureka Consolidated Works. The first-class ore is worth \$600 per ton, and the second class \$125.

The indications are now very strong in the Eureka Tunnel for getting a large body of high grade ore.

The Richmond Company still continue to ship large amounts of lead.

The Alexander Mine, on Prospect Mountain, is shipping a large amount of ore. The mine is located high up on the mountain, and pack mules are employed in conveying the ore in sacks to the road below the Ruby and Dunderberg Works, where the trains receive it and haul it to the furnaces.

Colonel Reilly is hauling slag from the old K K furnace to the Dunderberg to be used as flux.

The Alexandria Mine is producing some splendid ore.

The Prospect Mountain Tunnel has got into red line, which is a sure sign that there is ore near at hand.

The Bowman ore body is said to be widening right along to the northward.

The mill of the Morey Mining Company was to have started up yesterday, and if it is successful in working the ore of that district a very prosperous camp is assured. There are large quantities of ore at the mill to be worked.

We learn that the bonanza recently struck in the Geddes and Bertrand Mine, at Secret Canyon, increases in size and richness as development is made.

Considerable ore is coming in from Adam's Hill.

London, Sept. 6.

RUBY HILL.

#### THE CARADON DISTRICT.

SIR,—Having just returned from Liskeard and Camborne, I thought it might interest the readers of the Journal to hear about the condition of two or three of the mines I visited. Of course a man visits the mines he is interested in generally; my interests carried me to the two Caradons, West and New West, which have been now at work about 18 and 12 months respectively. Any one can get a better idea of a property by personal inspection in a few hours than he can by days of explanations in an office. The mining captain lives upon the ground at the mines in the centre of his work, which appears to me to be a great advantage. Having viewed from the West Caradon height the far-famed South Caradon Mine, which is so situated that it drains these two mines to a depth of 80 fathoms below adit, we examined the dressing-floors, tramways, engine, jiggers, and crushers, all of which have been planned with a view to the economical handling of the ore, which, when dressed for market, is lowered into tram wagons connected with the railroad to Looe, and by which also supplies can be obtained for trifling cost of transit and delivery. Capt. N. Richards deserves great credit for his skill and energy in planning all this, and at such a small outlay. These things, in these times, go a long way towards the success of a mine, and I cannot call to mind any mine that can be worked at such small expense—plenty water for dressing purposes, plenty power by a first-class winding engine, tramways everywhere, and no pumping charges. The Caradon ores are celebrated for their beauty and richness, and already the West Caradon has sold this year 560*l.* worth of copper ore and has over 200*l.* worth more on hand for sale this month, with a steady product from the different points in operation, and thousands of fathoms of whole ground left. Adjoining is the New West Caradon, which is a valuable tract containing several lodes, and to intersect which Capt. Richards is driving a cross-cut running parallel to the West Caradon boundary, so that any discovery in the one proves the other, as the cross-cut is only 15 fathoms west of the West Caradon boundary line. Finding in Liskeard that the tradesmen of whom the miners buy their stores have been busy picking up these shares and salting them down, I was desirous of ascertaining the inducement. It is simple and plain. Capt. Richards has come upon a lode 2 to 4 ft. wide in this cross-cut running across New West Caradon for 150 fathoms in whole ground west and east, into West Caradon; a lode now producing 3 to 4 tons per fathom. This is in a rise in the 42 fathom level. He has already upwards of 20 tons ore broken, ready for hauling, and as he commences stoping this week he hopes to get 40 tons per month. This I find is the attraction to the shrewd traders in Liskeard. With this in view how long will shares remain at 10s. each? This is the question. Of course no man can look into the bowels of the earth, but this appears to be

the present state of affairs, and any one can verify these things by a personal inspection.

So much was I impressed by what I saw that I increased my interest by wire to London at once, a resident of Liskeard who is well posted in all mining matters requesting me at the same time to purchase some shares for him. I had intended a few remarks about Polrose Mine, where a lode of beautiful copper and tin has just been cut at the 90 fathom cross-cut, but I must defer, with your permission, these remarks until next week.

Sept. 7.

A VISITOR TO CORNWALL

#### ROYAL CORNWALL SOCIETY EXHIBITION.

SIR,—At the opening of the Royal Cornwall Society Exhibition at Falmouth on Tuesday the president, the Rev. Canon Rogers, in his annual address expressed regret that there were very few exhibits this year connected with their most important industry—mining. Now as these exhibits consisted of Baxter's stone-breaker and of an air compressor and rock borer exhibited by ourselves, the number was certainly very few. Perhaps this is the reason why the "judges of mechanics" awarded medals for garden seats, school desks, and for "excellent workmanship in wigs!" Now, though as an engineer I know nothing about wigs, I do not doubt these special wigs were very good wigs; but I certainly should not have considered them machinery. If Canon Rogers knew the serious expense and trouble of exhibiting machinery he would not be surprised to find the Society failing to secure such exhibits; for the Society fails to give what exhibitors have a right to expect—bringing their exhibits immediately under the notice of those practically interested. For example, our expenses exhibiting above machinery in operation will probably exceed 50*l.*, and yet we were practically put out of sight at the graving dock, about a mile from the exhibition, and not the slightest intimation given as to our whereabouts; we are simply put down in the catalogue just like the wigs which gained a medal from the judges of mechanics.

Last year our compressors gained a medal at Truro, and have since gained the gold medal at the Melbourne Exhibition, and although liable to 27½ per cent. import duty they are extensively used in Australia, as some have been at work there over a year without costing a penny for repairs. They are also favourably known in Anglesey and Jersey, but the Royal Cornwall Polytechnic Society simply ignore them, doubtless considering them less important than desks and wigs. At the annual miners' meeting of the society held at Falmouth on Wednesday I was painfully impressed by finding much of the time occupied with protests as to partiality in awarding prizes to scholars, and to find the council at last agreed to reconsider their awards. However, it is clear that for some reason or other improved air compressors and rock borers are not welcome in Cornwall, and I therefore regret the trouble and expense we have incurred in this county.

Sept. 8.

A. NORMANDY, STILLWELL, AND CO.

#### THE COST-BOOK SYSTEM v. LIMITED LIABILITY.

SIR,—Speculators like myself always watch the post for your valuable Journal, but it appears to me, as well as my neighbours, that the disputes of brokers between themselves had better not appear, not that I happen to have dealt with any of those disputing, but it certainly deteriorates the value of the shares. It frightens bona fide holders like myself as to the dispute between Cost-book and Limited Liability. There can be no possible doubt that the Cost-book is the system for a shareholder speculating without any knowledge of the property, provided the system is honestly carried out. The people in Cornwall know this. Look, for instance, at the two valuable discoveries made near Callington this year—one of tin and the other of copper. What was done? Why the natives formed a Cost-book company of friends on the spot amongst themselves—not limited, with all the directors' fees, Mr. Secretary, expensive offices, and charges to pay. I know one limited company, unfortunately I took shares in, has paid 2000*l.* a-year for directors, secretary, manager, offices, &c., and has not returned one penny yet.—Sept. 8.

FOREST HILL.

#### COST-BOOK v. LIMITED LIABILITY.

SIR,—Mr. Sharp, having no more time to devote to the above subject, and having more interest in the Cost-book, can hunt up the Limited tin and copper mines for himself. He knows, as I pointed out, that the tin mines of Cornwall have all been conducted on the Cost-book system, and their enormous profits are the accumulation of nearly a century, whilst the profits recorded by Limited Liability cannot be credited with the period of a generation, therefore the comparisons made in favour of the Cost-book system are no proof of the superiority of that system.

Allow me to inform your readers, and also Mr. Sharp, that Carn Camborne is in course of formation into a Limited company. It was because of the dangerous nature of the Cost-book system that the shareholders decided to limit their liability. To use Mr. Sharp's favourite phrase, however, "at 3*l.* per share it is only 18,000*l.* for the property." Carn Camborne being in 6000 shares, the 8s. called up, small as it appears in comparison with the price of the shares, does not embrace the actual sum expended on the mine in plant, machinery, buildings, development, &c. Probably 5*l.* per share has actually been expended. I will now leave Mr. Sharp's readers "to draw their own conclusions."

G. S. GREGORY.

Gracechurch-street, Sept. 7.

#### LIMITED LIABILITY v. COST-BOOK.

SIR,—In last week's Journal Messrs. Watson say it is not true that they stated no Limited Liability Mines had paid. I can assure them that I have not the remotest inclination to misrepresent them. In the Journal of Aug. 6 they gave a list of Cost-book companies, both ancient and modern, including some which have very long ago ceased to exist, and others that paid for a period but for many years past have only been "calling," and they then remarked that the payment of millions of profit could not be said of Limited Liability companies, and that "dividends in most of them were remote." In reply to this I pointed out that the Limited Liability had been in force in this country less than 20 years, and I gave a list of companies so constituted that had already paid in the aggregate upwards of 2,000,000*l.* in dividends, none of which companies ever have been on the Cost-book system; and though some of them were at one time private partnerships, their profits increased enormously after they came under Limited Liability, the main cause of which was that sufficient capital was at once provided to enable the mines to be worked much more vigorously than any such system as the Cost-book would have allowed; a plan which, moreover, is the most economical in the end. The mistake which Messrs. Watson, and other advocates of the Cost-book, make is comparing the successful companies under that system for something like the last hundred years with the unsuccessful limited ones of one-fifth of that period. One would suppose from their remarks that there was not rather a lengthy list of Cost-book companies of the latter class.

Messrs. Watson's explanation of the original system followed under the Cost-book, which appeared in last week's Journal, is an elucidation of the subject. "In the old days of adventure in Cornwall a mine was held in 32 shares," the holders of which met every month, when each provided his portion of the loss, or the profits were divided, as the case might be. But since these old days the circumstances have very greatly altered. These adventures are divided into much larger numbers of shares, and the holders are scattered all over the United Kingdom, and are composed of all varieties of classes and persons. The holding of these short periodical meetings of all the partners to audit the accounts is impracticable, and in a majority of cases it is impossible to carry out the Cost-book System in its integrity or in its most essential points; besides which, it is not legally applicable to mines situate out of Cornwall or Devon. The following forcible illustration of the liability of shareholders under the Cost-book System:—"The registrar of the Stannaries Court sat at Truro on Monday, and made a call of 40*l.* a share on the list of names settled as contributories to this (Frank Mills) company." Each one is liable for this and any more such calls as may be required to pay the debts in full, and the costs of

winding up; and not only for his own proportion, but also for any of his co-partners as may, from any cause, be defaulters—in fact, each one is liable for all the debts and expenses if the others can't pay. This question should be discussed entirely on its merits. There is no necessity to introduce personal allusions or hints, and I have carefully avoided even the appearance of what is the furthest from my inclinations. I cannot understand any one acting otherwise, except to divert attention from the real points of the case.

Sept. 7.

G. W. RITCHIE.

#### LADY BERTHA MINE.

SIR,—Your correspondent, "W. S.," complains in a letter in the Journal of Aug. 27 that he could never obtain any information from the authorities of the Lady Bertha Mine; and he expresses a hope that you would send your reporter to the meeting, so that the public might have some idea as to what was being done. My experience differs in toto from that of your correspondent. I have called at the company's office three or four times, and have always been received most courteously by the secretary, Mr. Wright, and by his assistant. Any information they have had in their power to afford me has always been freely forthcoming. The shareholders will be pleased to see such a full report of the meeting in the Journal of Saturday, and it is a matter of congratulation that our mine is opening out so well.

In the Lady Bertha we have a mine that might well be termed "select." Starting as it did early last year with the small capital of 15,000*l.*, it has worked its way well to the front. It has sold 40 tons of copper ore and 360 tons of mundie. Added to this there are 200 tons of mundie at surface not sold, as also 10 tons of copper ore. A profit of over 500*l.* has been made, and we are to receive our first dividend of 1s. a share, which is equal to 5 per cent., as the shares are 1*l.* each, fully paid. The quantity of arsenical mundie already laid open for stoping is estimated by Capt. Thomas, of Cook's Kitchen, to be at least from 3000 to 4000 tons; and the directors in their report of Aug. 16 state that "when the eastern shaft is finished, which it is hoped will be in about another month, and the bottom levels made to communicate with the western shaft, 500 to 600 tons of ore can be hauled to surface every month."

One lode alone in the 40 fm. level is from 9 ft. to 10 ft. wide, and worth 50*l.* per fathom. The unissued shares, numbering about 3670, will at once be offered to the shareholders at par, and with this reserve capital the ground to the east of the eastern shaft will be immediately worked. In this portion we have a length of 500 fms. unexplored, and which did not belong to the old company. I will not trouble you with any further remarks, as "good wine needs no bush."—Sept. 5.

SHAREHOLDER.

#### SOUTH DARREN.

SIR,—Being desirous of purchasing a few more shares in the above mine, and having failed to do so at the quoted prices, I was much surprised to see an advertisement in the Journal of last week stating that there were no buyers at 18s., which I knew to be absolutely false. I immediately caused application to be made to the advertisers for some shares, and offered a good deal higher prices than they had named, but failed to obtain any. The only answer given was that they would see their client, coupled with abusive remarks to my representative. On enquiry about this firm I was informed that they had a personal quarrel with another shareholder who had been advocating the merits of South Darren, and to spite him they had advertised the above. Can you tell me whether the company, or any shareholder, could take proceedings for damages against people who thus wantonly injure their property to further their own personal end?—Sept. 6.

W. X.

#### SOUTH DARREN.

SIR,—Cannot the law reach those who maliciously and recklessly depreciate by public misstatements other people's property? Two advertising shareholders fall out, and one of them (named Edean) without the smallest justification, but simply to vent his spleen on his opponent, attacks the above mine, about which he has no knowledge whatever beyond the published official reports. He has no right to do this, and if he does know the actual state of the mine the matter is worse, as he would then knowingly state what was untrue, or write in a manner to lead others to erroneously believe that the mine was in a bad condition. Is the course he has adopted honest? He advertised last week that there were no buyers of the shares at 18s.; he might as well have said 5s., or any other ridiculous price. Of course there were no buyers at such quotations, for the best of all reasons that everyone knew that the shares could not be obtained. As soon as the above advertisement appeared the strongest evidence was at once given of its falsity by buyers at 25s. appearing, with no sellers (not even including the author of the advertisement, to whom many applications were made). I believe purchasers at nearly, if not quite, 30s. could easily be found.

This is one of the very best mines of the day, and when I mention that the capital is only 9000 shares of 30s. each, and that the mine is well found in good machinery, has already paid a good sum in dividends, and is at present making a profit even at present depressed prices for ore, I think impartial people will admit that if the shares were double 30s. they would be exceedingly cheap. The shaft is being sunk below the 120 in a rich lode, and in the 100, 110, and 120 there is good ore ground opened, and being added to monthly. The object and animus of the advertiser (Edean) is manifest. His aim is to injure his opponent in the same line of business, quite regardless of the means.—Sept. 7.

A SHAREHOLDER.

#### [ADVERTISEMENT.]

##### WHEAL JANE, HERODSFOT, AND CAPT. R. SOUTHEY.

SIR,—I regret to trouble you again in this matter. Capt. R. Southey was manager of Wheal Jane, he resigned, and had he not done so his services would have been dispensed with. His insinuation with regard to my tampering with the reports of Herodsfot is as groundless as his statement that the report of his inspection of that mine for me never appeared before the public, because it was of a different character to those I usually dealt in. I paid Capt. R. Southey 5*l.* 5s. in August, 1879, to inspect Herodsfot; his report was made public by me in that month, also again in September, 1879; this is another proof that no reliance can be placed in his statements. He stoops to falsehood to injure Herodsfot Mine (upon which he reported favourably) because he resigned the management of Wheal Jane, to avoid his services being dispensed with.

The following is a printed copy of Capt. Southey's report as it appeared in public:—

Herodsfot Mine, July 26, 1879. The engine-shaft is sunk almost perpendicular from surface 205 fms. They have commenced at the 106 to bring down the engine-shaft on the course of the lode, and if the men have sufficient air to work this will be communicated to the 205 through winzes and rises in about a month. At the 205 a level is driven 140 fms. south on the course of the lode; 10 fms. north of the end No. 1 slope is worth 1 ton of silver-lead per fathom. At this level an end is driven north about 4 fms., lode producing occasional stones of silver lead. Just behind the present end a rise is commenced in order to communicate with the shaft coming down from the 106, lode producing 15 cwt. silver-lead per fathom, and looking exceedingly kindly. I expect an improvement here shortly as the rise gets extended. Before concluding my remarks on the bottom level I may here add that throughout the drifts the lode maintains its size and character, being equal to any of the shallow levels, hence I see no reason why the next level should not be equally as productive as any of the former ones.

No. 2 slope in the bottom of the 190, and about 8 fms. north of No. 1 slope is worth about 15 dwts. of silver-lead per fathom. No. 3 slope at this level is worth 12 dwts. of silver-lead per fathom. No. 4 slope in the back of the 190, worth 10 dwts. of silver-lead per fathom. In bringing down the shaft already alluded to, a few good arches of ground have been met with, which produced some rich silver-lead ore, but at the same time the success of the mine greatly depends on the deeper levels; the lode on an average is large and the lead of a superior quality, being very rich for silver requires a great deal more care in dressing than has hitherto been bestowed on it.

Surface Operations: The dressing department is of the most primitive nature, the lode being very rich for silver requires the most delicate treatment; but looking at your present appliances it is very doubtful to me if you have ever realised more than one-half it contains, especially as regards the silver. I went into the river and took a sample of the stuff as it was washing down, and had it carefully assayed with the following results:—Lead 34 per cent., and silver 37½ ozs. to 1 ton, which plainly shows what you are losing. Substitute a crusher with machine jiggers attached, and in adopting this course I am safe in saying you will save cent. per cent. in your dressing cost, and realise a far greater percentage of both lead and silver.

The mine is situated on the side of a hill, and affords natural facilities rarely to be met with for laying out a dressing floor on the most approved modern principles; you do not require expensive machinery, as with proper treatment



and suitable appliances the stuff is easily dressed; and I would suggest in the first place to select all the richer portions of the lead as it comes from underground—i.e., the solid lumps—and then break it down by hand labour; after that crush the remainder with an ordinary crusher, classify the same, and let it pass into the jiggers; this should all be self-acting so that the slimes which contain a large amount of silver, and which you now lose by treating it with the rougher portion, would then flow into separate catches to be treated with the ordinary machine frames, which are inexpensive to erect, and can be worked very cheaply. In conclusion, I beg to state the quality of the ore is rich, and the lode in the bottom of the mine is very large, varying in size from 3 ft. to 6 ft. wide, and in some places making some very good deposits of silver-lead ore; therefore, I consider the prospects of the mine going down to be exceptionally good.—RICHARD SOUTHEY.

I will add, in conclusion, it is not my desire to damage Capt. R. Southeys character; he has done that himself, and I would advise him to look well to it, that he does not further injure himself by his folly, and thus lose the management of West and East Chiverton Mines. Some men when raised above the level of the so-called common miner, and placed in a higher position, too frequently forget themselves and the duties due to those who employ them. If any shareholder in Wheal Jane will give me a personal interview I will tell him my reason (beyond that of reducing the mine expenses) for wishing to be quit of Capt. Southeys services as manager. I cannot descend to Capt. R. Southeys level, and, therefore, leave him to his own devices, assisted by his friends, the "well-known" firm. "Birds of a feather flock together." H. GOULD SHARP.

Threadneedle-street, London, Sept. 6.

#### A PLEA FOR WHEAL VOR.

SIR,—It is pleasant to be reminded from time to time, as now in the prospectus of the New Great Wheal Vor, of the riches which have been turned up from the district immediately around us, and no less charming is it to note the confidence with which the directors (all of them no doubt versed in the art and mystery of mining) promise handsome dividends to their shareholders. Let us hope their financial statistics are more accurate than the historical statements given in the prospectus. We are there told that at Great Wheal Vor the first steam-engine in Cornwall was erected in 1748, and that in 1815 it was there that the first Cornish stamping mill was set up. How is it that such assertions should pass muster with the regulation colonel, captain, baronet, and civil engineer of the board? If we refer to Prof. Pole on the Steam-Engine, or to the published papers of the late Mr. J. Carne, we find that the first fire-engine was erected at Wheal Vor before 1714, and as for the stamping mill for tin stuff, not only is it figured and fully described in Cornish works of the last century, but Carew, in his "Survey of Cornwall," has given an account of its construction and use by the old tinners some 300 years ago. Naturally jealous of the honour of what belongs to our local "vals,"—Breaage, Sept. 8.

CASSITERITE.

#### TRESAVEAN MINES.

SIR,—I read with regret some statements in the *Mining Journal* of last Saturday, emanating from a person writing anonymously as "Miner," in reference to these mines. "Miner" asserts that the mines are exhausted from top to bottom. Now, sir, Captain W. Teague, of Tincroft, Josiah James, of Wheal Comfort, W. T. White, of Wheal Pevor, James Opie, of Redruth, and a number of other well known mining experts, including Mr. John Kendall and Captain Prisk, of the Phoenix United Mine, have publicly testified by their written reports that the mines are as rich as any in Cornwall, that very little tin has been taken from them, and that from the bottom to the surface tin ground is standing ready to be taken away at a cost of about 6s. per ton. If "Miner" is correct all these well known experts must be wrong, but the public will probably prefer to believe the reports of the latter until such time, at any rate, as "Miner" shall choose to prove that his opinion is worthy of credence by writing under his own name or stating his qualification for advancing an opinion on the mines at all. A LARGE SHAREHOLDER.

Bedford Park, Chiswick.

#### LEADHILLS, AND ITS MANAGEMENT.

SIR,—I see by the report in your valuable *Journal* that our directors are again in a congratulating mood, and perhaps one of them will kindly explain what grounds he considers the unhappy shareholders have for congratulation. Take my case for instance. I paid 7l. for my shares, and I have not received a dividend for three years. We hear a good deal about the excessive royalty paid to the noble owner of Leadhills. I only hope his lordship when they apply to him for a reduction will tell them plainly that until the shareholders take the trouble to look after their own interests he will not abate one shilling whilst the mine is managed as at present. We are now told by our directors there is gold in Leadhills, and that steps should be taken regarding it; they further tell us that the cottagers in the neighbourhood are anxious to be allowed to explore the mine, in order that they may be allowed to collect enough to present to his lordship on his coming of age. I trust the directors will give them permission, and will permit them to take our minister and surgeon with them. Surely the directors must think the shareholders are children, and if they can swallow such nonsense as this I, for one, shall not think they have formed an erroneous opinion of us. SHAREHOLDER.

#### LEAD DEPOSITS IN CARDIGANSHIRE.

SIR,—The columns of the *Mining Journal* are always open to those who are maltreated. I have for millions of years been quietly reposing, not 6 in. under the grass of one of the highest hills in Cardiganshire. Rain, frost, and sun have bleached me and covered me with a hoar-frost of carbonate, and some year and a half ago, when the set I belong to was unoccupied and in the market, no one thinking it of value, some neighbours got permission to make a "leat" to gain a larger water supply from our unused pools. They scratched the clothes off my back in two places and exposed me to view, but never saw they had so done. They further insulted me by letting a lot of nasty cold water trickle over my bare back, giving me the "shivers." But after a while the property was taken up, and the last few weeks the water, no longer required, was to my inexpressible comfort turned off, and my back got warmed by the sun. A solid old sheep with long wool rubbed his back against mine, and I kept tight hold of some of his wool to protect me against the coming winter. But there came a boy of more than usual intelligence who was a "wool-gathering," but still kept his wits about him. He seized the wool and ran off to his father crying out in Welsh something that sounded to me very like Eureka, and reminded me of a few centuries back, which seems but as yesterday in my long life, when a Greek gentleman called Aristotle ran down the street with no clothes on, to the scandal of respectable Athenians, in such a hurry was he to announce to a friend his discovery of specific gravity. The boy's parent proceeded to belabour my back and ribs with a nasty sharp iron, and in ten minutes I and several more of my friends were pulled out of bed and laid on the grass.

Crowds came to see us, I regret to say neglecting the Sunday chapel, but I was the master pig, and claimed most admiration. I since hear that I am quite small potatoes, and that some of my friends weigh 2 cwt. and upwards. I heard them say I was to be sent to my owners in London, but on the night of Aug. 29 some people came and carried me down the hill, and nailed me down in a box, so that I could only just see through the crevices. That I was put into a red cart with a lot of letter-bags, and taken to Aberystwyth and vanned to a great Midland county town which is famed for spurious jewelry and Liberal gas. I had always expected, by the way, to be "vanned" in quite a different style. Several others of my family, amounting to several hundred pounds weight, have also been surreptitiously conveyed away, and some I know are the only ornaments of a lion's den—his den producing nothing but bare rocks. Now, Sir, what am I to do? I fear I am, in common with my other stolen relations, going to be made a fraud of. I have heard one of my owners say that he lately saw a mine sold on samples which came from 4000 miles from the mine they were reputed to be from. Sheep though much alike can be sworn to anywhere by their shepherd, and any one can swear to my identity who knows Cardiganshire ores. I remember the great beasts centuries ago, when I was comparatively young used to each other. The smaller beasts of the present day only pick each others ore pockets, but let the

public beware of being deceived by representations that my venerable self came from any other place than NANT-Y-CRIA.

#### NEGLECTED TIN MINES—WHEAL SISTERS.

SIR,—Nearly all mines producing tin in any quantity have risen in value, some 50, and some as much as 500 per cent., but the shares in the mine under notice have not advanced at all, for the simple reason that they are held by those who well know the intrinsic value of the property, and who are content to await the results of the operations, irrespective of market price, and well they may, considering that more than half the concern is held by such men as Messrs. Bolitho and R. R. Mitchell and Co. The property consists of Wheal Margaret, Wheal Kitty (Lelant), Trecrom, and Wheal Mary. Those who have been acquainted with Cornish mines for the past 10 years will, doubtless, remember that Wheal Margaret shares were always marketable at from 50l. to 70l. per share, Wheal Kitty at from 10l. to 15l. Trecrom and Wheal Mary were worked almost privately, consequently I have no records.

The present position of Wheal Sisters is simply this—a large amount of money has been expended upon dead work (which in a limited company would have been placed to capital account), but in this case has been met by the money realised by the sales of tin. The necessary dead work and renewal of plant, &c., has now been accomplished, and in future the money realised by the sale of tin will have to be put against the current cost, and I am of opinion that in future the balance will be largely in favour of the adventurers. The mines employ upwards of 500 hands, and the net output of tin is about 150 tons quarterly—equal in money value to nearly 9000l. Several points in the mines have much improved of late, and the increased value of tin is likely to cause a demand for shares producing that metal, so that I would advise those making a selection not to omit this from their list. VIATOR.

Coleman-street, Sept. 9.

#### THE TIN HILL MINING COMPANY.

SIR,—An important communication has been received from the Secretary of the Tin Hill Mines, who is on a visit of inspection to the property. A full report containing analyses of the work in progress, development and returns of tin, being too late for insertion this week, must be deferred to another time. Suffice it to say, that the prospects of Tin Hill have never been so good; large quantities of low grade ore are to be seen at the surface and underground, sufficient to keep the stamps at full work and presently to necessitate a large increase in the stamping power, that one of the lodes is returning tinstone of 7 cwt. of tin to the ton, and that a short time will witness the sale of a good parcel with every prospect of continuing the same. DALSTON AND CO.

Threadneedle-street, Sept. 9.

#### TAVISTOCK GREAT CONSOLS.

SIR,—Please allow me to ask through the *Mining Journal* if it is a fact that the captain of this mine has suspended opening on the reported great discovery of tin, and put the men to search for better ventilation. They have been for some time past almost at surface. Is it a fact they fear to move in the late discovery. A few years ago (probably seven or eight) the world was to be surprised by the grand discovery of a new mode of zinc dressing at this mine. But as the captain could not convert the mineral into clean tin ore by the new process he lost his situation, and the whole thing became one of the past—finally what accrued?—TAVISTOCK, Sept. 7.

T. G.

#### THE WHEAL FORTUNE MINING COMPANY.

SIR,—This company is working a mine at Harrowbarrow, near Calstock. The mine was formerly known as the Queen Mine, and it is now principally worked for silver ore. I notice in last week's *Mining Journal*, page 1097, a Summary of the Mineral Produce of the United Kingdom for the year ending 1880. In this summary silver ore is put down as 14 tons 8 cwt., value 2691l. 17s. 1d. Curious to know what mines yielded this silver ore, I sent to London and obtained the volume of Mineral Statistics, by Mr. Robert Hunt, now in course of review in your columns. I find on page 167 the Wheal Fortune described—No. 31 in the eastern district of Cornwall, and on page 55 the particulars of the output of silver ore from the same mine in 1880, 1 ton 16 cwt. 1 qr. 4 lbs., value 2418l., with a foot note that "this, according to returns, produced 806 ozs. of silver." There has been a great mistake somewhere, and surely Mr. Hunt ought to know whether a few hundred pounds or a few thousand pounds is the correct value of 1 ton 16 cwt. 1 qr. 4 lbs. of ore. The accuracy of these mineral statistics is a very important matter, and unless they can be relied upon they are of little use for purposes of comparison with returns of former years. There is evidently a mistake of over 2000l. under the head of—SILVER ORE.

Callington, Sept. 7.

P.S.—The 806 ozs. would only represent 200l., even allowing 5s. per ounce.

#### BEDFORD UNITED MINES.

SIR,—I am highly gratified to see it announced that the right sort of stuff is in the Bridge lode, going towards Wheal Crebor. Some say it will be another Marquis, but this statement is, of course, problematical. I believe, as a general rule in mining, that the safest course is to imitate the respected manager of Dolcoath, who always takes care to ascertain facts before he prophesies, and who has thus reached a high pinnacle in the mining world. Mining, probably, stands second only to farming, and valuable and indispensable riches of all kinds are wisely deposited, we know not how, for the use of man by the Great Architect of our grand old sublunary spheroid. AN OLD AMATEUR.

#### CAMBRIAN MINING COMPANY.

SIR,—Allow me to inform the lady who signs herself "A Disgusted Lady," in writing of the Cambrian Mining Company's meeting held on Aug. 25 that her adjectives are very much wilder than anything that took place at that meeting. I took part in it, and I must say I never saw cooler solicitors, calmer clergymen, or milder doctors. No doubt there was some loud talking by some members of the company, but it certainly could not be characterised in any such terms as noted in her letter. I have been a shareholder of the company a few years, and have endeavoured to know how the mines were being managed by visiting them and otherwise, and as far as my knowledge goes no mine or business whatever could profit under such management. I have considerable sympathy for Col. T. G. Cholmondeley, because I feel he did not weigh the matter well when he entered the directorate. When I became a shareholder some time after the company was started his name was brought prominently forward as being a gentleman who would make any company right. In coming forward to the meeting he acted as a gentleman, and I do not think he would complain in the least of any questions which were so pointedly put to him by the Rev. M. Macgregor. Had the lady signed her name I have no doubt it would have explained her indignation and wrath. I have great hopes yet in the Cambrian Mines, if the directors who are likely to be appointed are well supported. Mr. John Lean seems to be very familiar with the figures 100,000l., but I doubt if anything like that sum will be required to develop these mines under good management. J. C. MONTGOMERIE.

VICTORINE.—A circular from the secretary informs the shareholders that the company's general superintendent's reports show that the mines promise to realise all the expectations formed of them. In two letters Mr. Morgan states that the mine is looking splendidly, and on Aug. 14 writes:—"The machinery is coming in well, and the mill is making daily steady progress towards completion. The mine is looking very well indeed. I am busy over the grade for the tramway, which ought to be ready for the cars in about three weeks or so. The Evening Star has proved, as I anticipated, the north extension of the Victorine, and is looking well. I have four different parties tendering for hauling ore; I shall let a contract for one year, from 70 to 100 tons per day. I could bring down much more, but the mine is not sufficiently blocked out for me to get more than fifty men in at a time. I want to keep on prospecting and not to retard progress; but about this time next year I can double the size of the mill, and, if necessary, get down 500 tons

a day. I know I have got the ore. I have 50,000 tons blocked out ready to stoop. I am getting everything now in good shape, and all is looking most favourably."

#### ROYAL CORNWALL POLYTECHNIC SOCIETY.

The forty-ninth annual Exhibition of the Royal Cornwall Polytechnic Society has been held this week at Falmouth, with a full amount of success. Allowing for variation between the different departments, the display was fully up to the average, and the hall probably never presented a more attractive appearance. It is true that numerically there was some falling off in the mechanical section, and that objects of interest and importance specially connected with the mining pursuits of the county were unusually short. But, apart from this, there was a wider display of matters of general concern, and elsewhere there was an equally marked advance.

Thus, in the section of Ornamental Art, which is yearly growing in extent and value, there was a magnificent display of wrought and cast-iron metal work, by Messrs. Bishops and Barnard, of Norwich, who had a first silver medal, and the actual executor of the wrought ironwork—F. Amis—a first bronze. Messrs. Benham and Froud, medalled last year, also sent a fine collection of *repoussé* work in brass. Then in Pottery a first silver went to Mr. Brannen, of Barnstaple, for his Devonshire sgraffito and other ware, a most successful art continuation of a pottery and style which is purely local, and has existed in Devon for nearly two centuries; while Mr. Kirkham, of Torquay, had a second silver for his exquisite flower group in the new Devonshire glazed Parian. When is Cornwall, with her unrivalled series of clays, going to enter this promising field? Then in fine contrast and illustration was a stand filled by Mr. Burton, of Falmouth, probably the largest importer of Oriental manufactures in the country, with the choicest examples of Japanese tapestry, cloisonné, Kaga ware and jewellery, India metal work, and a host of other illustrative miscellanies.

Fine Arts was well represented, and Photography never so strong. The Polytechnic has attained an unrivalled position in the provinces in this regard. The instantaneous work and appliances were specially noteworthy. Natural History was unusually good.

Of the Mechanical section we make the following more extended notes:—

Messrs. Baxter and Co., Leeds, exhibited their patent knapping motion stone-breaker and ore crusher. The peculiarity of this machine is an ingenious combination of a crank radius link or lever. The stone is broken by a sudden blow, given at one quarter of a revolution. The jaw then remains stationary during the next half revolution, and the backward motion is accomplished in the remaining quarter. The drawback motion compresses the spring when the jaw is returning. The advantages claimed are a saving in a given quantity of material broken of half the power, and that the stone when broken (for road purposes) is more evenly cubed, with 50 per cent. less waste. For reducing ore, of course the latter point is practically immaterial. In order that the apparatus might be thoroughly tested it was tried at the docks on a quantity of hard tin capel from Dolcoath, and did admirable work. A second silver medal was awarded.

Messrs. Normandy, Stilwell, and Co., London, exhibited their air compressor and rock-drill, which were shown in operation at the docks. The air compressor of this firm, it will be remembered, is without valves, and noiseless, and the drills valveless also, the absence of valves being a special feature in both forms of apparatus. The compressor has a four-way cock between the two cylinders, which are kept cool by water. It worked very steadily and effectively, and the drill also, the latter performing a full average of work for the quality stone in boring a 9-inch hole in a block of hard granite in 2½ minutes. For a wonder it was the only drill shown. Others were entered, but did not turn up in time; and, of course, it will be borne in mind that, thanks in no small measure to the Polytechnic Society, mechanical boring is now thoroughly established in the West.

Mr. A. Pryor sent a drawing of a pulveriser for tin ore, consisting of a cast-iron cylinder with an extra lining 1½ in. thick, put in segments so as to be easily replaced when necessary. On this works a weight of 5 cwt., with an extra shoe, to be replaced when worn out. A wrought-iron bar, with a couple of levers, prevents the weight from being carried round with the cylinder. The machine has been introduced at Holmbush, and is said to be working satisfactorily at several other mines in the neighbourhood. The judges were of opinion that the value of the invention could only be tested in operation, and decided that further data on this head were necessary.

Dobson's patent reticulated and perforated furnace bars were exhibited by Messrs. Clarke and Co., Nottingham. These bars give a very flat surface for stoking, and have such narrow openings that the very smallest fuel may be consumed with the least amount of waste. At the same time the air-space under the grate is so large that a good current of air is secured, and with it complete combustion. While much lighter than ordinary bars, this great circulation of air keeps them so cool that they have much longer "lives." Freedom from clinkers, moreover, is another and not the least of their advantages. They have come very largely into use, and have been recently introduced into Cornwall. The judges recommended further trials in the locality.

The self-cleaning filters of Mr. Joseph Halliday, of Manchester, are so arranged, being attached directly to the main, that they are air-tight, and the water passes through at high pressure, a continuous supply of thoroughly filtered water being always given. Cleansing is instantaneously effected by reversing the steam, which is done by simply turning a hand on a dial-plate. In addition to removing all organic impurities and matters held in suspension, the filter removes some of the mineral bases held in solution. The filtering material will last two to three years. The judges were of opinion that this apparatus might be usefully introduced to cleanse the too commonly foul feed of mine boilers. If the dressing water could be cleaned in any similar way we should hear far less of the "Red River" waste than we do, but that probably is beyond "filter" scope.

Mr. Snelling, London, forwarded a series of drawings of his patent valves and gear as applied to the compound pumping-engines. The valves are worked by a cam lever fixed at the centre of the stroke of the piston crosshead, the lever being actuated by a friction roller carried upon the end of the crosshead pin. The engine is regulated by the piston of the regulating cylinder acting upon the valve gear, which causes the travel of the valves to be lengthened or shortened according to the load upon the engine. The chief advantage claimed for the valve gear is that it can be worked direct from the piston crosshead, and a quick admission and cut-off be obtained without the aid of cut-off plates on the back of the main valves. The judges, however, failed to see that it contained any effective novelty or practical improvement.

The patent "reflex" principle of Mr. Samuel Mead, of Birmingham, was shown, applied to a garden bench and seat, but it applied also to school fittings, library chairs, and the like. The back is momentarily turned into an easy and convenient table.

A new water regulator, designed to do away with the old ball tap, was shown by Messrs. Wright and Stephens, of Plymouth. The lever may be used, but in the ordinary forms it is dispensed with and the hollow ball only used. The supply is stopped by the flotation principle applied direct on the end of the supply pipe. The water is admitted through the ball and out off by the ball rising and closing an annular india-rubber valve. The whole arrangement, while exceedingly simple and unlikely to get out of order, is very sensitive, and a novel feature is that the quantity of water supplied can be absolutely regulated. It will be seen that this is a very valuable point in these days of constant supply. Given a system fitted with these regulators, it is absolutely certain that not more than a definite quantity can be used, so that waste beyond this is wholly prevented. Of course the user must see to it, but his cistern is large enough to store for any sudden demand. The entrance stream too is most gentle. The judges regarded this one of the most important exhibits, and gave a first bronze medal.

Mr. John Sampson, Liskeard, exhibited his patent water waste preventer, attached to a cottage closet. A controlling lever is introduced in connection with a ball cock, communicating by means of a loop or link. There is a special form of discharge valve, with a "lost motion" connection. The management is effective.

Mr. J. Bickle, Keyham, sent a new marine engine counter, worked



by a tube from a fan blast, driven by belts from a pulley on main shaft. A fan is fixed horizontally on the spindle of an ordinary ball governor, the revolution of which actuates the index. The advantages are considered too doubtful for award.

Various forms of gas apparatus took a prominent position in the hall. One of the most important of these was the "Stott" self-acting gas valve or governor of Messrs. J. Stott and Co., Oldham. This is intended for consumers, effecting a saving in the consumption of gas of 15 to 40 per cent., and is already very largely in use. It is a mercurial valve, so arranged that there can be no loss of mercury. When the gas pressure is increased an inverted glass box, fitted to an annular trough containing mercury, rises and reduces the supply. When the pressure falls the cup drops and increases the delivery. Several important improvements in detail have been effected recently. First bronze medal.

Another form of gas governor, medalled last year, is that of Mr. Cox, which was exhibited by Messrs. Stark, of Torquay, and which has proved thoroughly efficient. Messrs. Stark also exhibited a series of Cox's patent "save all" gas stoves, with improvements, and a full series of McCormack's excellent stocks and dies, expanding taps, and pipe wrenches. The gas stoves have the flame entirely outside the oven, and an important improvement has been introduced in the ventilation. A first bronze medal was awarded for them, and a second bronze for the series of McCormack's appliances.

Mr. C. N. Cox showed a self-acting syphon. The arms are of nearly equal length, turned up at the ends with elbows. This retains the charge, and keeps the syphon always ready for work whatever the condition of the discharging vessel.

Mr. Heron, Manchester, illustrated in the fullest way the operation of his patent duplex gas burner. This burner consists of a little chamber with two jets, the flames of which combine into one, producing complete combustion. The gas in the chamber expands by the heat. The value of the light is unquestionable, and the concomitant saving is put at at least 25 per cent. The burner was highly commended for its combination of the chamber and double flame.

Mr. Cadwell, Camborne, was also highly commended for his improved "dial," which is exceptionally steady and admirably made. Mr. Letcher would have shown a new dial, which is highly spoken of, but was unfortunately too late.

There was an unusually large entry of vehicles of various kinds, with a notable array of bicycles and tricycles, including the special machines of the Coventry Machinists' Company, Exeter Bicycle and Tricycle Company, Messrs. Stanley, Beach, Baylis, Thomas, &c.; the "Chelysmore," Devon Salvo, Sociable Salvo, Royal Mail, Eclipse, and Excelsior—not all in competition. The "Salvo" had a first bronze medal. Mr. Powell exhibited a dog cart fitted with a patent equilibrium attachment, which appears to work well, and also had a first bronze. The like award was further made to Mr. R. Brabys, who showed a two-wheeled vehicle for common roads with patent improvements. The special feature is a short, independent axle to each wheel, tightened like mill shafting.

"Guidance" lamps, with wing reflectors, well tested since last year, and much improved, were shown by Mr. Westaway. They not only make the most of the light but they direct it in precisely the most advantageous position, and constitute one of the greatest comforts in night driving.

Hancock's patent potato peeler, which by a series of brushes removes all the peel without waste, was shown in operation.

To the spherical castors of Messrs. Heath, which seem to leave little, if anything, more to be desired in this direction, a first bronze medal was given.

Marine architecture and engineering was represented less largely than usual by models, but there were three general entries of considerable practical interest.

Mr. W. Hewitt, Bristol, forwarded a model of a screw propeller, so arranged that the pitch of the blades can be altered at pleasure, or the screw brought into a fore and aft position from the inside of the ship, the pitch and exact position being always known by means of a self-recording index.

Messrs. Johnson, Gregson, Curry, and Co., Limehouse, sent a model of four of their patent sleeping berths and dressing-rooms for married emigrants, which have now been thoroughly well tested in practice. They were highly approved by the judges, and had a first bronze medal.

A model, shown by Mr. C. Nichols, of Kingsand, near Plymouth, for stopping a rush of water into a ship when the exterior skin becomes fractured, embodies several important details. It attacks leaks both from within and without—without by peculiarly arranged mats, and within by the application of matting between the frames, secured with clutches, angle-iron spans, and screws. Bulkheads with water-tight doors are likewise employed.

The Holmes' Marine Life Protection Association (Limited) sent a series of Holmes' improved fog horns and rescue lights, which were explained by Mr. Holmes in an interesting lecture. The lights were awarded a first bronze medal.

Yet another exhibit in the same class was a beautifully made model, or rather pair of models, of the new Eddystone Lighthouse, by Mr. B. Ford, of Plymouth, made to scale in bright metal work, and showing details of construction. To Messrs. Messum, of Richmond, the society were indebted for one of the most beautifully finished models that ever entered the hall—a Thames rowing boat.

Another very good model in a different style, was that of Messrs. Massey's steam-hammer.

Messrs. Ihlee and Horne, London, were last year awarded a silver medal for their exhibit of Balmain's luminous paint. This year the properties of that material were most interestingly and strikingly illustrated by a dark room, the ceiling of which had been painted on Balmaine. We say "dark," but it was "light," for every detail of the contents of the apartment was effectively visible. The photographic department, by the way, contained ingenious adaptations of the paint to actinometers—being used as a standard of illumination.

The exhibition was opened at one o'clock on Tuesday, when the president, the Rev. Canon ROGERS, delivered his inaugural address. It dealt chiefly with an exposition of the chief interest and value of the main features of the exhibition in its various departments, but incidentally expressed the opinion that in time to come a very large use would be made in connection with the mining enterprise of the county of its tidal and wind power; probably through the storage of electric energy to some extent, but also in more direct ways, and indicated enquiry and research in this direction as affording good prospects for inventors. Next year is the jubilee of the society, and the president suggested that an effort should be made to celebrate this in special ways. One of the most useful means of attaining that end would be by making the Exhibition of 1882 a kind of record of progress, and by contrasting, so far as possible, the means and resources in mechanics and art, &c., of the county half a century ago and then. If they could obtain the actual articles, or a number of them, shown at the first Exhibition it would be a very interesting feature in itself. Some remarks upon the mutual inter-dependence when pursued of apparently the most diverse branches of science, and upon the importance of even its most seemingly insignificant details, were appropriately introduced.

Mr. A. PENDARVES VIVIAN, M.P., moved and Mr. WARINGTON SMYTH, F.R.S., seconded a vote of thanks to the President, and both of them took the occasion to make a number of highly practical remarks. Mr. Vivian pointed out how difficult it was at the moment rightly to appraise the amount of progress that might be making, and expressed his belief that notwithstanding the present rapid advance, the steam-engine was not doomed to such a sudden and immediate disappearance, as some had predicted. In his opinion it had a great deal of work to do yet.

Mr. WARINGTON SMYTH dwelt chiefly upon the progress which had been made, especially of late years, in the development of mining skill, method, and mechanism. There was a very remarkable difference in the conduct of mining operations now compared with what he saw when he first made his acquaintance with the county. After, however, all that had been done, they must regard mining, in its means and appliances, as in purely a transition state; and his view was that instead of invention being by any means exhausted, there never was a time when such prospects were afforded to inventors, and he earnestly directed the attention of young engineers and others

to the prospects which opened out before them. After all that had been done there was very much more to do yet, and there were men in Cornwall who could and should do their share.

#### THE MINERS' ASSOCIATION OF CORNWALL AND DEVON.

The annual meeting of the Miners' Association of Cornwall and Devon was held, as usual, at the Polytechnic Hall, on Wednesday, the second day of the Exhibition. In consequence, partly of that day and place being chosen for the annual excursion of the members of the various classes, there was a very large attendance. Mr. A. P. Vivian, M.P., presided. There were present among others Canon Rogers, Capt. N. Williams, President of the Mining Institute; Capt. W. Teague, Mr. W. Husband, Messrs. C. Twite, B. Kitto, N. Sara, E. Borlase, S. Bennetts, J. Beringer, A. L. Fox, Capt. Lean, Capt. Rich, Capt. James, Mr. G. Michell, Capt. Garland, Capt. Bishop, Mr. Barnett, Mr. Trelohan, Mr. Gill, and a large number of the students of the various classes.

The report of the Council was read by W. C. Twite, joint honorary secretary:—

The Council, after congratulating the members on the continued prosperity of the Association and the satisfactory condition of its finances, said the work of the past year, which had been mainly educational, has been successfully carried out by the various teachers recognised by the association, although there had not been quite so many students attending the classes as in the previous year. The local exhibitor to the Royal School of Mines, John Henry Johns, had attended Prof. Smythe's lectures on the Principles of Mining and those of Prof. Chandler Roberts on Metallurgy, and had in every way acquitted himself to the satisfaction of the executive Council. The Council had awarded him the medal of the Association. No local exhibitor had been awarded this year, as it was made a condition that the recipient must have obtained the Association medal. This necessitated working at least a year underground. It followed that any local exhibitor from the Miners' Association must be a practical miner. J. F. Collins, who last year gained a Royal Exhibition prize for three years to the Royal School of Mines had evidenced his attentive application by gaining one of the two annual exhibitions for the first year's course at the School. The *Mining Journal*, Council, and other prizes had been awarded as follows, some having still to be postponed:—Mineralogy: *Mining Journal*, E. Opie, Camborne;—Geology: *Mining Journal*, W. H. Pellet, Penzance;—Council: W. A. Humphreys, Penzance;—Principles of Mining: A. A. Johns, Tuckingmill;—Council: Simon Vivian, ditto;—Applied Mechanics: Mercury prize, G. Haggarty, Keyham;—Council: P. Marrack, Keyham;—Theoretical Mechanics: W. H. Eastcott, Keyham;—Steam: Mining World prize, W. J. Whittingham, Keyham;—Machine Construction and Drawing: West Briton prize, John Eustice, Camborne;—Council: G. Haggarty, Keyham;—Mathematics: Cornwall Gazette, W. H. Eastcott, Keyham; W. J. Whittingham, Keyham;—Magnetism and Electricity: Council, R. W. Smitham, Wheal Vor; Mr. Trelohan's Prize: George Davey, Redruth;—Acoustics, Light, and Heat: W. E. Treweeke, Redruth;—Building Construction: Arthur Carkeek, Redruth;—Mr. Warren's Prize: William Metcalf, Keyham. The assaying prize would be given as the result of an examination, to be held at Camborne Laboratory on the ensuing Friday.

The Council had to deplore the loss occasioned by the removal of both their secretary and assistant secretary for the county. Mr. J. H. Collins devoted time and attention for many years to the interests of the association, and its annual reports showed how frequently and how well he contributed papers of importance to mining industry. Mr. Benedict Kitto had been eight years lecturer and assistant secretary, and during his period of office the classes had increased in numbers and importance. Much of the present prosperity of the association was clearly owing to Mr. Kitto's ability and zeal. His suave and gentle manners had won for him sincere friends among the members of the association, and the council wished him health and prosperity in his new sphere. The vacancy caused by Mr. Collins's resignation was filled by the appointment of Dr. Hudson, of Redruth, who as an old member of the executive consented to hold office until the annual meeting, and with whom Mr. Twite had been since associated by the council. The council advertised for a successor to Mr. Kitto at a salary of 100l. a year and the grants from the science and art department. Twelve applications were received, and many of the candidates were considered well qualified for the office, but the almost unanimous vote of the council was in favour of Mr. J. Beringer, an old pupil of the association, who as Royal Exhibitor distinguished himself at the School of Mines, and became a member of the association, and who had been a scientific teacher during the session 1880-1 while assistant to the Professor of Metallurgy at King's College, London. The founder of the association, Mr. Robert Hunt, F.R.S., continued to take great interest in its prosperity, and had lately urged on the council the propriety of making the classes more practical, and with a more direct bearing on mining as an industry. The council hoped to carry out his views in connection with the technological classes of the City and Guilds of London Institute, to whom the thanks of the association were due not only for the special grant from its funds but for the incorporation in their syllabus of such subjects as mechanical dressing of ores and mine surveying.

Mr. BENEDICT KITTO, the lecturer for the year, reported:—It gives me pleasure to report that the interest and work in the classes, both by pupils and teachers, has in no way diminished, although the numbers passing the last May examinations are rather below that of last year. I cannot help again drawing the attention of the Association to the small number of passes in mineralogy. In all the sciences recognised by the Association as bearing more or less on mining there are altogether between 300 and 400 passes; out of these only seven are on mineralogy. This is owing in some measure to the wide range taken in the examination papers, but more especially to the importance attached to the less useful part of the subject as far as those attending our classes are concerned. The various causes, such people generally as these science classes are meant specially to benefit. In my own classes I have always endeavoured to give such instruction as the students can with most advantage apply in their occupation as miners. My own experience is that very advanced acquirements in crystallography are not necessary to those attending our classes, and that too much attention is paid to this, as I consider, one of the least useful branches of mineralogy, although when well studied perhaps the most fascinating, and as a means of training it is undoubtedly most useful. In my own classes I have given far more time to initiating the pupils into the use of the blow-pipe, my reason being that this is training young mining men in a method of directly applying their knowledge to a useful purpose, and I have experienced very little difficulty in imparting so much instruction in this direction in the course of a year's attendance at the class lessons as will enable any young man of average intelligence to find out by means of such apparatus and reagents in powder as they can carry in their pockets the presence or absence of all the common and useful constituents of stones put into their hands, whether such constituents be metallic or non-metallic. I venture, therefore, to put the matter strongly to the council, and recommend that the difficulty experienced by our young men in passing the May examinations in mineralogy should be fairly represented to the authorities at South Kensington. Our classes have generally supplied the majority of those passing such examinations every year, and the number would be considerably increased if a syllabus could be issued in which greater encouragement should be given to the study of such branches of the subject as is most useful to miners and others having to do with minerals, and at the same time be more precise in the range teachers are expected to take in the different stages of the subject.

Canon ROGERS proposed the acceptance and adoption of the report, which was seconded by Capt. TEAGUE.

Mr. A. K. BARNETT asked why the result of the examination in chemistry had been postponed?

Mr. KITTO replied that in inorganic chemistry no member had taken more than a second in the advanced stage. Great difficulty had been felt in deciding between the candidates, and South Kensington had been applied to to state which really had taken the best position. The same conditions of equality existed in practical chemistry, and the secretary of the Science and Art Examinations had been applied to for information on that point also.

Mr. BARNETT objected to the course adopted, as outside the conditions laid down, and objected also to an award in building construction.—Mr. KITTO rejoined that that course had been adopted before, and really secured that the awards went to the students who took the highest place.—Mr. TRELLOHAN, Keyham, thoroughly endorsed the action of the Council.

Mr. GILL, of Helston, brought forward the case of a student of his own, who he thought should have had the preference in practical chemistry, as having made the greatest advance in the year.

Mr. KITTO said that personally he quite agreed with Mr. Gill, but the Council had thought otherwise.

Mr. BARNETT insisted that the proper course to adopt was to follow out the system suggested in the four printed rules. This would remove an impression that the association was chiefly worked for the classes round Camborne.

Canon ROGERS remarked that the Council had not been able to discuss these matters as fully as could be desired, and he would suggest that they be reconsidered at a special meeting. Mr. Basset's laboratory, at Camborne, of course, gave special facilities for advanced lectures.

This suggestion was accepted, and with this understanding the reports were adopted. It was pointed out that the Council had been placed under great difficulty in consequence of the change in their staff, &c.

Canon ROGERS stated that it had been arranged that Mr. Beringer should give two of his evenings a week to the classes outside Camborne.

Mr. HUSBAND was very glad that Mr. Barnett had expressed his views. The council wished to do nothing that would interfere with the proper working of the institution for all the districts. The association was a county association.

Mr. BARNETT remarked that Penzance had a laboratory as well as Camborne, and did as advanced work.

The CHAIRMAN said that the association might be certain that the council would do nothing that would militate against the proper

working of the association, or to give ground for any suspicion of partiality. The only paper was on the Mount Bischoff tin mine, read by Capt. W. Teague.

Capt. John Davey, late of Copper Hill, had sent an interesting letter descriptive of Mount Bischoff, of which the following abstract was read. The letter was written May 23, from a visit made in the previous February:—

Mount Bischoff is surrounded by a cluster of mountains. To the north of these is the Waratah river. On the south bank of this river, at the foot of the mountains, is the Waratah township, which has sprung up since the mines were discovered, and is from 70 to 75 miles west of Deloraine, and 43 to 50 miles south of Emu Bay. From Waratah to Emu Bay a track 20 to 25 fms. wide has been cut, and a horse tramway with wooden rails—6 in. by 4 in. section—has been laid. This was done by the Van Diemen's Land Company, who charge 4l. per ton for carriage from the mines to Emu Bay. The track passes through a forest of eucalyptus, myrtle, blackwood, &c., worth in England 1000l. per acre, but there valueless. The rain lasts nine months in the year, and the soil is very fertile. The mining district is apportioned in sets, having each a square horizontal section of 80 acres; these are granted by the Van Diemen's Land Company for 15 years, at a yearly rent of 5s. an acre, and there is no further royalty. Of all the mines in the district the Mount Bischoff Company's and another, in which they are working on a lode, are the only two doing much. Mount Bischoff returns about 250 tons of tin a month, and the company is not likely to increase the quantity. The average quality stuff worked yields 2½ to 3 per cent. of black tin, which assays 75 per cent. of white metal. The ground is very easy to break, requiring little or no blasting, and is broken by labourers, who are paid 7s. to 9s. a day.

It is worked in a long slope about 90 ft. high, and considerably more than 100 fms. long. The floor of this slope is very rich in tin, and a shaft sunk in it 36 ft. showed it good to that depth. To work this they will go back to lower ground and bring in another slope, but the "red face" itself which they are now working will last for years. The tin ground is separated from the white kills, which forms the back of the mountain, by a "slide." In the Stanhope Mine, adjoining Mount Bischoff, a shaft has been sunk on the slide under the impression that it is a lode. The tin ground of Mount Bischoff lasts only a few fathoms into the Stanhope set. It is very rich in iron, and as long as the iron holds strong the tin continues good, but the iron disappears before the Stanhope set is reached, and the tin gradually dies away. In Mount Bischoff they think they have a lode running through the middle of this tin ground, but although the ground contains most iron there, and is also richest in tin, Capt. Davey would not like to call it "something" in which they have driven a level a lode. On the opposite side of the mountain in a place called Slaughter House Yard some rich stones of tin have been found in white kills, but they have made very little trial of this, merely sinking a shaft or two here and there to such depths as they can get at with stopped by water. Lying exposed on the surface on the top of Mount Bischoff are rocks of very rich tin stuff weighing tons, and looking like gossan. The dressing department is a marvel, and well worth a visit. They jig a great deal of their stuff, using water-power. Their stamping is very small indeed. Capt. Davey believes they are losing a very large quantity of tin; in fact, the Waratah river below the dressing-house may appropriately be called "Red River." One of the companies occupying a section of land adjoining the river are said to be catching, dressing, and selling 50 tons of black tin monthly. The Mount Bischoff Company is rather cramped for room on the course of the stream below the dressing-house, but the manager is felling trees in order to extend his dressing department, and thus save more tin. None of the stuff requires roasting or calcining. The freight to the smelting-house at Launceston is 12s. 6d. a ton.

The CHAIRMAN expressed a hope that the paper would be fully discussed.

Mr. KITTO pointed out that hitherto the tin had been raised in Tasmania by alluvial working, and Capt. Davey said he would be sorry to call what he saw a "lode." Could anyone say whether there were lodes there or not?

The CHAIRMAN thought it very hopeful that Capt. Davey did not think there was a lode. His experience of Comstock was that they had not a true lode there, and he hoped that Mount Bischoff would prove to be only alluvial. But if there were lodes they could not be worked to come into successful competition with Cornish mines, so far as experience proved. In California the gold lode mines did not have the same success as the alluvial.

Mr. HUSBAND drew the lesson that they should improve their mining operations all they could. If tin failed after all, why they were Englishmen, and could work at something else.

Mr. CRAIG gave instances of successful lode mining in California. There might be a lode after all at Mount Bischoff.

Mr. BARNETT had seen many tinstones from Australia which had all the appearance of coming from true lodes.

Capt. WILLIAMS thought a very satisfactory feature of the whole business was that notwithstanding all the tin of Australia the demand had more than overtaken the supply.

Capt. RICH believed Cornwall would hold its own. They certainly had very great advantages in Australia in paying no dues.

Mr. KITTO gathered that nothing was raised from the so-called lode.

Canon ROGERS pointed out that the Council wished to make the work of the Association as technical and practical as possible, specially encouraging mine surveying, assaying, the use of the blow-pipe, ore dressing, and other allied matters. He quite agreed with the remark of Mr. Kitto on this head. It was most important that the really practical part of mineralogy should be thoroughly kept up. Another branch that should have special attention was mechanics. The Council were determined to make the Association as practical as possible, and Mr. Beringer would do all he could.

Mr. HUSBAND, in moving a vote of thanks to the Chairman, took the opportunity to direct attention to the need of greater attention being paid to mechanics. They had gone back in that county. He was sorry to see it; and impressed upon all the young men who heard him to give their attention to that. If an engine would not work effectively with a consumption of 3 lbs. of coal per hour something was wrong. They were told that 50 years hence the steam engine would be superseded. That might be so or not, but very great changes were certain, and he impressed upon all his hearers the immense importance of paying attention to electricity, which was rapidly coming to the front, not only as a lighting agent, but as a motive force, and one that would certainly be employed in various mining purposes.

Canon ROGERS, in seconding, pointed to wind as a source of energy which could be stored.

The adoption of the vote concluded the proceedings, and Mr. VIVIAN, in replying, heartily enforced Mr. Husband's remarks. They should not only do as well as they had been in Cornwall but better. Immense progress had been made in marine engines; why not in Cornish? Wherever improvement was possible improvement should be made.

#### NORTH STAFFORDSHIRE MINING INSTITUTE.

A meeting of members was held at Stoke-on-Trent, on Monday Mr. John Brown, Birmingham, the President for the year, in the chair. Mr. Henry Godfrey, Wedgwood Colliery, Tunstall, was elected a member of the Institute. Mr. Charles Lawton read a paper on The Explosive Properties of Fire-Damp and Coal Dust, as demonstrated by Prof. Abel. After supplying an outline of the report, he said that in the course of his summary of the results of his experiments, Prof. Abel concluded that coal dust would operate as an explosive agent through the medium of a proportion of fire-damp in the air of a mine, the existence of which in the absence of the dust would not be attended with any danger, and that although the explosion might occur through the agency of a non-combustible powder, and might be of a very mild or feeble character in the first instance, it might be almost at once increased by the coal dust which the first ignition would raise and bring into action. With such information before them they should try if they could by their united efforts invent a remedy to counteract this dangerous condition of their dusty mines. In the absence of any practical appliances for detecting so small a proportion of fire-damp in the air as would (according to Prof. Abel) cause an explosion when mixed with coal dust, he (Mr. Lawton) thought their only remedy at present seemed to be water, the application of which would, however, be attended with much difficulty in many other mines. He then made various suggestions as to ventilation, the minimising of blasting in dusty mines, and the means of securing good discipline underground.—A discussion followed, in which it was explained that in the earliest days of the Institute this subject had engaged the attention of members, and that Prof. Abel had demonstrated the accuracy of the opinions expressed years ago at meetings of the Institute, when persons high in authority were sceptical on the subject.—The paper was ordered to be printed, and it was stated that an additional paper on the dust question would be read at the next meeting. Messrs. Davis and Son, opticians, Derby, exhibited a galvanometer, and other mining instruments; and Mr. Davis, jun., read some results of experiments made on lightning conductors. It was announced that arrangements had been completed for an excursion to South Wales, to visit next week the Do-



laid Iron and Steelworks, and Harris's Navigation Colliery. The start will be made on Monday.

#### SOUTH STAFFORDSHIRE AND EAST WORCESTERSHIRE INSTITUTE OF MINING ENGINEERS.

The monthly meeting was held at the Mining Museum, Dudley, on Monday, Mr. Wm. Farnworth, Vice-President, in the chair. A vote of thanks was passed to Mr. J. P. Baker, Her Majesty's Inspector of Mines, for a copy of his report for 1880. The proofs of boiler rules were presented and adopted. Mr. F. Scott, of Stockport, exhibited fine samples of his patent "improved compound wire rope," the chief features being its great flexibility, and from the formation of the strands, all being uniformly twisted in the same direction, the tensional and torsional strains are equalised, and by the introduction of fibrous cores in the interstices of the inner wire the cutting action at the points of contact, where the wires cross each other, is obviated, and also prevents water from percolating into its interior, thus preventing corrosion. The samples were well examined, and members expressed themselves satisfied with the improvement. Mr. Scott presented the samples to the Institute for the museum, and promised to keep the Institute informed of its working. Mr. Alexander Smith, M. Inst., C.E., gave an illustrated description of L'Anson's apparatus for the prevention of overwinding, after which a brief discussion ensued, but members were of opinion that it was not suitable for high speed. Votes of thanks were passed to Mr. Scott, and also to Messrs. L'Anson and Son.

#### MODERN GOLD MINING.

In response to Mr. A. G. Lock's enquiry as to the machinery used at various mines and in different districts, Mr. Thomas Price, of the Placerville Gold Quartz Company's works, writes that the mill has 20 stamps, averaging 800 lbs. (?) each, and that each battery of five has a self feeder; the stamps are made to fall about seventy-five times per minute. The screens used are of thin slotted Russian iron—150 holes to the inch. The stuff passes over 20 ft. of 18 in. sluice, lined with silver-plated copper plates, constantly kept bright. The tailings pass over Hendy's concentrators, one to each five stamps, thence over 20 ft. blanket-lined sluices and 50 ft. coarse canvas-lined sluices; and finally over 64 ft. of riffle sluices. The material caught on the concentrators and blankets is passed through an amalgamating pan, and settler, and agitator. The materials saved on the coarse canvas and riffle sluices are further concentrated in a Cornish buddle, as are also all the tailings from the amalgamating pan and settler. The quantity of quicksilver placed in the mortars or coffers is regulated by the appearance of the copper plate in front of the battery; the quicksilver is fed at intervals of half an hour. The blankets are washed every hour, the coarse canvas every three hours. The tailings are regularly and carefully sampled; the same have been assayed by him, with results varying from mere traces to 75 cents per ton; in one instance only did they ever reach as high as 1½ per ton. They endeavour to arrange, as near as they possibly can a speed of some 75 drops to the stamps per minute. Of course this would be largely increased, and consequent increase of crushing; but this would be at the expense of losing a much higher percentage of gold. They have never had any trouble with the flouing of the mercury.

In commenting upon Mr. Lock's paper Mr. Price explains that in the matter of "gauge of grating or screens," the size of the screens should depend entirely upon the fineness of the gold in the quartz. If the gold should be diffused in a finely divided state through the quartz, it is evident that finer crushing must be had than if the gold were coarse. All the protection to the mortar by leaving the dies rest upon a layer of sand has always been in use. They have not had any broken mortar as yet. The stamp heads and the dies upon which they strike are of the same size; this they consider a protection to the mortar and stamp-head—that is the layer of sand under the dies. With such fine gold as they have to deal with at the Placerville they could not expect much fine gold caught in this material. They rely upon the amalgamated copper plates inside of the battery for this purpose, and he has no hesitation in stating that this is by far the best way to catch the maximum amount of gold. In the early days of gold mining in California the stamps were used simply for the crushing of the ore, the amalgamation was conducted on the outside entirely, the only gold caught in the battery being coarse particles that could not pass through the screens. Experience has taught the mill men there that the latter method is not only more expensive but by far less effective. He does not agree with Mr. Lock that the system of putting mercury into the stamp coffers, and using amalgamating plates is radically wrong. The loss of quicksilver flouing does not trouble them at Placerville. Mr. Price also claims that the particles of amalgam passing through the screens are caught either on the copper-plates in front, or on the Hendy concentrator, and if any escapes here, why they have the blankets, coarse canvas and riffle sluices, and finally the Cornish buddle.

The mercury riffles and mercury troughs, favourably mentioned by Mr. Lock, are likewise disapproved of by Mr. Price, who remarks that within the last few weeks he had some experience with this system. He had to examine a mine where they were in use, having been put in and erected by an experienced Australian mill man. He found the tailings contained an abnormal quantity of gold. The owners found it necessary to change this system to amalgamation on copper-plates inside the battery, with the usual outside appendages, already described. The statement that the gold is flattened out by pulverisation in the battery is not a fact, as the gold is really brittle, and is rather pulverised into small irregular particles than beaten or hammered out into thin plates. The flouing of the mercury is not caused by the presence of sulphide of iron, so far as his experience goes, but such is the case when sulphides of copper and lead are present in any considerable quantity. In all their clean-ups at the Placerville Mill they have never had any trouble with the flouing or the sickening of the quicksilver. The system of concentrating on blankets, as done in some places, collects not only the gold, but much of the metallic iron produced by the wear and tear of the shoes and dies. The only way to ascertain the true value of auriferous quartz, assaying only from ½ to 1 oz. gold per ton, when dealing with hundreds of tons per month, is by a careful system of sampling the tailings. The total clean-up, plus amount in tailings, represents the total amount per ton. They sample their tailings at Placerville by taking a bucketful of tailings at regular intervals of two hours, water and all, from the final tailings through a large filter; at the end of each week the accumulated samples are averaged, and at the end of the month the weekly samples are again mixed and an average sample taken, which Mr. Price assays.

As to the facts connected with the value of tailings from quartz mills in California—and his observations would, probably, apply with equal force with regard to Australian and Indian gold mines—Mr. Price states that during the last 18 years he has been in the country he has had occasion to examine a very large number of gold quartz mines. At a very large number of these mines large piles of tailings had accumulated; many of these piles he has had occasion to sample, as they were represented to be very rich; but, as a rule, he did not find them sufficiently rich to pay for the handling. It is a very popular thing for a superintendent to say his mine is good, plenty of gold in the quartz, but it is so rebellious that it is impossible to save the gold. Many such a mine Mr. Price has had occasion to examine, and, to the sorrow of the stockholders, found out that the rebellious character was due entirely to the fact that the quartz contained but little gold. He has no hesitation in stating that, with proper care and attention, the system he has described as used in the company's mill at Placerville is more effective for the quartz they have to deal with than the one described by Mr. Lock. What gold they cannot save on the mortar-plates, copper-plates in front, Hendy's concentrator, and the blankets and canvas, the riffle boxes and Cornish buddles will catch.

These few facts so completely upset the whole of Mr. Lock's theories that it is not surprising that he displays a disposition to dispute them; but, unfortunately, the authorities which he quotes in support of his views are gentlemen who, although of high social and scientific position, possess little or none of that practical knowledge

and experience which can alone prove useful in working mines with a view to return profit upon the capital embarked in them. The mere fact of a man being a graduate of the Freiberg, or any other School of Mines, proves nothing, unless it be accompanied by evidence that practical experience has been subsequently had; and, as a rule, the opinion of these individuals is but little more reliable than that of merely practical miners without scientific training. Mr. Lock mentions that in his United States Government Report in 1875 Prof. R. W. Raymond states that, with a few exceptions, from one-third to one-fourth of the assay value of the ores now being worked, amounting to several million dollars annually, is irretrievably lost. Mr. Almarin B. Paul, who as the inventor of gold saving machinery would naturally desire to show that there was something for his machinery to save, states, according to Mr. Lock, that the loss in America "is fully 50 per cent., and in the majority of mills all 60 per cent., of what the ore contains." Mr. Lock, in continuation, mentions that Mr. George J. Firmin states that in the Black Hills, Dakota, "they only obtain from 10 to 15 per cent. of the gold," and that the general result of his enquiries throughout the country is "that not more than 50 per cent. of the assay value is recovered on the average."

And to show that this supposed waste of gold is not confined to the United States, Mr. Lock adds that Mr. Edwin Gilpin, A.M., F.G.S., the Inspector of Mines for Nova Scotia, reports that since returns have been collected, which enable him to ascertain results, 19,000 tons of pyrites, containing on an average 2 ozs. 4 dwts. of gold, and 4 ozs. 17 dwts. silver, with a value of 107. 10s. per ton, have "been thrown away; in other words, over a million of dollars has been thrown into brooks and swamps during the last 18 years." In a letter to me, in March last, he characterises this loss as due to the fact of "the chief idea being to pass as much as possible through the mill, and turn the tailings into the nearest brook."

After quoting Mr. Walter A. Skidmore's tables showing that the losses sustained in gold mining countries are—Piedmont, 35 per cent.; Hungary, 50; Chili, 66; Australia, 25; Colorado, 40; and California, 27 per cent. Mr. Lock continues that in a letter written in February last, by Mr. F. Guinness, warden and resident magistrate of the Collingwood gold fields, Nelson, New Zealand, in which he speaks of the melancholy fact that, through the inadequacy of the appliances and the want of knowledge how to extract the gold, the district, after repeated trials, has been deserted, and gold mining abandoned, "little or no gold being obtained, yet the analyses of the quartz gave results of most hopeful returns, as much as 4½ ozs. of gold to the ton having been obtained from stone which Dr. Hector and myself took out of the reef." Mr. Price's criticisms will, doubtless, lead to an interesting discussion, and whether the practicals or the scientists ultimately prove to be right great benefit must result from the solution of the questions raised by Mr. Lock's paper.

#### REPORT FROM CORNWALL.

Sept. 8.—Our forecasts of the real condition of the tin market continue to be fully justified by the result. Whatever casual and accidental or speculative fluctuations there may be the tone of the market is exceedingly and progressively healthy, and a material advance cannot be evaded, or even much longer delayed.

The annual meetings of the Royal Cornwall Polytechnic Society and Miners' Association have been held this week under encouraging auspices. Reports of both will be found in another column, and show that each is pursuing a useful, if at times seemingly unobtrusive, career.

It would be very desirable, if possible, that some definite attempt were made to evoke united action on the part of both mines and miners for the settlement of the issue raised by the Employers' Liability Act. There are a few signs which seem to indicate that possibly—by no means certainly—there may be trouble ahead if something in this direction is not done. No time like the present for settling this matter, and no body so capable of taking the initiative as the Mining Institute. Of one thing we are certain—no permanent or satisfactory settlement can be effected, seeing the tendency of modern legislation by "contracting out." The Act may fairly be accepted and worked to the satisfaction of all concerned without the imposition of any additional burdens by an extension and modification of the club system.

We made some notes last week upon the remarkable feature presented by Dolcoath alike in a practical and a scientific point of view. Following out the same line of argument the West Briton remarks:—

We are all familiar with the fact that it was Dolcoath which first established the principle that copper lodes might make tin in depth when it was unknown to the scientific world, but the present lesson of the richness of tin lodes in extreme depth is much more important; *a priori* it was impossible to pronounce what the result of sinking on an exhausted copper lode might be, and true science makes no guesses. When Dolcoath had once established a probability it was comparatively easy to lead up to a possibility in other cases, and at length by a wide and wise induction to make what was possible certain, and to deduce from scattered instances a general law. The point to which we at present refer, however, is of a different character, and one in which experience is simply illustrating and proving scientific hypothesis. Many years since it was recognised that the density of the earth was in excess of the density of its crust, and that, therefore, the materials which go to make up the earth in depth are of greater average specific gravity than those with which our explorations have yet made us acquainted, and presumably metallic—at any rate, to a large extent. Now the whole experience of late years at Dolcoath seems to point precisely in this direction. The bottom level is the richest in the mine, and the deeper the sinking the richer the lode. We believe from what we have heard that the value of the mine at this point is nearer 3000, a fathom than the 2500, quoted in the report. Dolcoath is now the deepest mine in the county, and has reached a depth from the surface of something like 2300 ft., and is within an appreciable distance (some 60 fms.) of half a mile in perpendicular sinkage. Yet there is not only no sign of exhaustion, but the contrary. Why may we not expect that as Dolcoath has led the way in one discovery it may not in another, and that in the next generation a "deep" mine and a "rich" mine may not be practically synonymous? Since these lines appeared a confirmation of the basis on which the argument is founded has been supplied by Sir John Lubbock in his presidential address at York to the members of the British Association in his statement that the earth is now distinctly made out to be a solid mass. In that case of the essentially metallic character of its ore there can be no question, unless we are to assume that it consists of substances as yet unknown.

There seem to have been some valuable hints given at the same meeting with regard to the utilisation of waste sources of power, particularly tidal and wind. It is quite on the cards that some of the existing difficulties in the way of this utilisation may be resolved by transference and storage as electric energy. Recent discoveries in this direction open up vast possibilities.

#### TRADE IN SOUTH WALES.

Sept. 8.—The activity of the Steam Coal Trade in this district shows no sign of abatement. The quantity sent away from Cardiff since last report has been 107,367 tons; Newport, 25,077 tons; Swansea, 11,797 tons. The latter port, which seemed to revive a little, has gone back to its old "form," in consequence of the terrible weather. Great preparations are being made there for the anticipated visit of the Prince and Princess of Wales next month to open the new dock, and large bodies of police are being engaged from neighbouring towns for the occasion, as well as from the Metropolis. At Cardiff, where additional dock accommodation is so much needed, no steps are being taken to provide for it, although much talk has taken place. The dock property of the Marquis of Bute is paying better now than on any former occasion, and therefore shippers look to him to supply what is so much needed. The patent fuel trade is good at Swansea, where, indeed, most of this article is shipped. The amount sent away during the week has been 5708 tons, and 3155 tons from Cardiff. The pitwood trade is steady, and 2342 tons have been received. A man has been fined at Neath for smoking in the Swan and Baglan Collieries, but as the amount was only 10s. and costs it will not have much of a deterrent effect. The prospects of the iron trade, as far as orders are concerned, are good, and as the continental and American advances are of an encouraging nature there seems no reason for apprehension for some time to come. Ironmasters complain about prices, but it is certain that that is the condition upon which works are kept going. With an increase of prices trade would soon depart to other quarters. The amount sent away from Newport last week was 4589 tons, and 1700 tons from Cardiff. The arrivals of iron ore at Cardiff have been 14,694 tons, while 5606 tons have been received at Newport from Bilbao, and 4225 tons from other quarters. The

Tin-Plate industry seems in a fair way of recovery after the long depression. Some of the works will be formed into limited companies, which with a steady output may stand a chance of achieving their old condition of prosperity.

Messrs. Farebrother, Lye, and Palmer offered for sale by auction, at the Royal Hotel, Cardiff, on Wednesday, a portion of the Garth Ironworks, at Taff's Well, near Cardiff, which have now been lying idle for some years. The property, comprising several blocks of buildings, canal, basin, and wharf, residence, workmen's cottages—occupying in all about 11 acres—though remarkably well situated, did not realise the amount it was expected to do. There was a very small attendance, and the bidding was by no means spirited. Eventually the works were knocked down to Mr. W. P. Strawson, of the firm of Woods and Co., Stourbridge. The sale will be continued at the works to-morrow, when Messrs. Farebrother, Lye, and Palmer will put up for auction the plant and machinery, which includes four horizontal steam-engines, a donkey engine, Cornish, and other boilers, steam-hammers, weighing machines, &c. The sale is by order of the liquidators.

#### REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Sept. 8.—This afternoon's Change in Birmingham had about it a more cheery feeling than some people had been led to expect, remembering that the bad harvest reports had caused a curtailment of the enquiries for iron. But ironmasters reported that they had not suffered to much extent, and that they believed that the present shyness of buyers to enter the market would soon pass away in face of the better weather. Mill and forge proprietors who roll sheets and hoops continue fully on, and makers of other descriptions are also active, though not to so large an extent as in the cases just mentioned. Vendors refused to give way from their recent rates. Boiler plates were 87. 9s. to 97. 10s.; sheets (single), 77. 15s.; doubles, 87. 10s.; lattens, 07. 15s. to 107. Bars ranged from 77. as the "standard" for marked sorts, to 57. 15s. for common descriptions. Tin-plate makers reported a very fair demand, but it is still impossible to realise any advance in prices, notwithstanding the slightly better rates prevailing in South Wales. Pig-makers announced that there was not any falling off in the somewhat improved position which their business has occupied of late. Best foreign pigs were decidedly firm—indeed, the agent for the Barrow Company reported that the principals were refusing 65s. for their forge hematites delivered in this district, and that they demanded a further 2s. 6d. Tredgar hematites remained at 65s. Native all mine pigs were 62s. 6d. to 60s., and medium quality pigs 45s. to 50s., according to the mixture. Ironstone was rather scarce and prices were strong. Coal was in over supply as to all the descriptions.

The Wages Board, which has done so much in the interests of the South Staffordshire ironworkers, is being allowed to die a natural death, for a large number of masters and men alike withhold their support. On Monday, at a mass meeting of ironworkers, the men's secretary to the board advocated a federation of the ironworkers throughout the country, and intimated that the quarterly reports on existing selling prices and wages would in future be available only to members of the board.

The well-worn subject of the dangers arising from the dusty nature of the North Staffordshire collieries was revived again on Monday evening at a meeting of the North Staffordshire Mining Institute by a discussion on the results of Prof. Abel's experiments on the explosive properties of fire-damp and coal dust. A prominent member of the Institute urged that measures should be taken to minimise or nullify the existing risk by the application of water, which seemed to be the only available remedy. Various suggestions bearing on the subject were made as to ventilation and the minimising of blasting in dusty mines. The Institute will shortly give the subject their further attention.

The directors of the Muntz Metal Company (Limited), at their meeting on Monday, resolved to declare an interim dividend at the rate of 7½ per cent. per annum out of the ascertained profits of the six months ending June 30.

The Sicker Safe and Strong Room Company (Limited), Soho, have received a cablegram informing them that their safes, "Sicker," have taken the gold medal at the Adelaide Exhibition.

In the Chancery Division, on Wednesday, Mr. Justice Kay heard the petition of the Eagle Coal and Iron Company, of West Bromwich, and of Thomas Hall, praying that the voluntary winding-up of Joseph Wright and Company might be continued under the supervision of the Court. Both petitioners were creditors of the company, which was registered in 1875, with a nominal capital of 50,000l., divided into 5000 shares of 10l. each. The number of shares actually issued was 4917, but the company resumed 300 of them, leaving 4617, all of which were fully paid up. Besides this, the company had borrowed 20,000l. upon mortgage and by debentures, and the claims by unsecured creditors amounted to 10,000l. Resolutions for winding up voluntarily were passed on Aug. 20 last, but several actions had been brought against the company, and it was with the view of stopping them that the supervision order was asked. Mr. Marten, Q.C., appeared in support of the petition, and, there being no opposition, Mr. Justice Kay made the order as prayed.

#### REPORT FROM DERBYSHIRE AND YORKSHIRE.

Sept. 8.—Affairs of a mining character in Derbyshire have undergone but little change of late, the principal event being still the successful clearing of the Magpie Mine, and the encouraging prospects that are now before the company. The event was duly celebrated by a dinner to the workmen on Saturday last, when it was stated that the work of clearing the water commenced on March 3, 1873, and was completed on Aug. 18, when the water rushed into the river. It is to be hoped that the heavy expenditure made by the company will be quickly recouped, for the spirit shown in undertaking such a costly piece of work, occupying so much time, during which all was going out and nothing coming in, to say the least, deserves success. There are other mines in which little is being done, and not a few standing, that with similar spirit and capital might be converted into profitable concerns, and Derbyshire might again attain the position it formerly occupied as a lead-producing county. Not much ironstone is being raised in any part of the county, and the consequence is that now Northamptonshire stands next to Cleveland in the production of it, the principal consumers being the ironmasters of Derbyshire and the adjoining county.

There has not been much change of late in the business doing in pig, and prices remain without any alteration, although, perhaps, a little firmer than they were. In manufactured iron quietness still prevails, the mills not running to anything like their extent; but most of the foundries are working steadily, and one or two are well off as regards certain specialties. Steel rails are being actively produced at Dronfield, and some heavy orders for them are still in hand. The coal trade is getting better, and the weather has had a tendency to stimulate consumers to have their cellars stocked for winter consumption. Lately more house coal has been sent to London, especially by the Midland Railway from collieries in the Chesterfield and Alfreton districts, in which the Claycross, Grassmoor, Blackwell, Eckington, Staveley, and many other mines are situated. Steam coal has been in tolerably fair request up to the present time; but so far as regards shipments the demand may now be expected to fall off. There has, however, been no decline with respect to the quantity required at the ironworks or railway companies. Engine fuel has been in perhaps better request, more particularly for some of the manufacturing districts in Lancashire and Cheshire, and a little more is also being done in gas coal.

Some few branches of the Sheffield trade are not so busy as they have been, our own markets, owing to harvesting operations, as well as other causes, being much quieter than they were in the earlier part of the year. The heavy trades, with scarcely any exception, are still active, and are likely to continue so. Heavy orders are in course of execution for armour plates of the new type for the Admiralty, and others are coming to hand from foreign Governments desirous of having the best armaments and the least penetrable vessels. Many of the plates now made are not more than seven or ten inches in thickness, pretty equally divided as regards iron and



steel—the latter, of course, being to the front. Steel plates are now being more extensively made for ordinary shipbuilding purposes than ever, and boilers are also being made from the same material. There has been no decline as regards ordinary plates, and sheets, telegraph and other wire, and the mills engaged on them are running well. The demand for hematite iron is still large, for there is still a heavy output of Bessemer rails, as well as of most descriptions of railway material; cast-steel wheels for collieries, in particular, are in increasing request, and so also are railway wheels, axles, and tyres.

The cutlery branches are the reverse of busy, although some few houses are looking well, more particularly in the best descriptions of table and pocket knives. Some of the file-workers are fairly off for business, and the same is the case as regards edge tools, sheep-shears, and some qualities of saws. The foundries are now busier than for some time past in stoves, grates, and fittings, but engineers and machinists are by no means busy.

The coal trade of South Yorkshire is looking better, there being a better enquiry for household qualities, but merchants are not inclined to make any advance upon the summer prices, which have been, as a rule, below the paying point. Rather more is passing over the Great Northern to London, whilst a good deal of steam coal is going to Grimsby for shipment to the Baltic, and to Goole for the home ports.

The Holme Colliery is now standing, and the result of the liquidation proceedings is looked forward to in the district with some interest. The Dodworth Silkstone Colliery is undergoing a similar ordeal, but it is expected to be opened shortly. An effort has been made by some of the old shareholders to take Thorp's North Gawber Colliery, but with what success has not transpired in the district.

#### TRADE OF THE TYNE AND WEAR.

Sept. 7.—The coal trade has been much retarded during the past week owing to severe weather in the North Sea, which has caused a scarcity of tonnage in those rivers; owing to this the steam collieries have been working irregularly. The weather now, however, is more moderate, and with a good supply of tonnage the steam coal trade will be very active, as a large quantity of coal must be sent to the Baltic this month. The gas coal collieries are busy, there has been a better supply of coasting vessels than of foreign, and those works have been kept fully going. There is a good demand for coasting coal, that is for house coal, and prices are improving. On the whole the coal and coke trades here are improving, although generally speaking the prices received are not yet satisfactory. There has been a good arrival of steamers during the past three days, and shipments are improving, and will continue so over the week. A small fleet of steamers has been engaged this week for Cronstadt, but tonnage is still short, and more vessels are wanted for the Baltic. The coasting demand for house and gas coal is improving daily; rates are getting higher. There is a difficulty in this trade, too, in getting the requisite amount of tonnage. Best gas collieries are very fully employed, and steam collieries are also full of work. The demand for second-class Durham coal continues to improve, and values are in some instances a little better. In coke there is a fair trade.

The pig-iron trade has continued dull during the past week, though more interest has been, on the whole, exhibited, caused partly by a movement in the Scotch market. There has consequently been some speculation by merchants and others, and consumers are now expected to come into the market, as their stocks purchased some time ago are running out. The effect of issuing the returns of the Cleveland Ironmasters Association has been to raise the price of Cleveland pig-iron 6d. per ton, making the price now 37s. per ton for No. 3. The account has caused some surprise, as it was expected that stocks would show an increase of about 12,000 tons as compared with July. The returns are, however, said to be perfectly correct, and while the make has been increased by 2000 tons odd, as compared with July, stocks have only increased during the month by 607 tons. This fact has had the effect of causing much animation in the trade, as the shipments and consignments by rail have evidently been largely increased. It is also stated that Messrs. Bolckow and Vaughan are causing a large quantity of Cleveland pig-iron for conversion into steel by the Gilchrist Thomas process. The manufactured iron trade continues pretty steady; the works are generally fairly employed. There is little change in rates, but there is a rising tendency. There is an improved enquiry for coals and coke at Middlesbrough; coke has been sold forward over a large portion of next year at about present prices in some cases. It is stated that Messrs. Cammell and Co., of Sheffield, are about to transfer or erect extensive works for the manufacture of steel at Workington, on the west coast, and it is expected that a good deal of Durham coke will be consumed at those works.

At Middlesbrough, on Tuesday, there was considerable excitement respecting the late returns, and some doubts were expressed as to their value, but the officials of the Ironmasters' Association uphold their accuracy, and, therefore, they must be accepted. Makers asked increased rates, and quoted 37s. 3d. for No. 3; but the general market rate cannot be put at more than 37s. Buyers, though not pressing, were willing to purchase until the end of the year at these rates. Warrants are not much enquired after, and were quoted at 37s. 6d. No. 3. Messrs. Connall's stocks have advanced 100 tons in the week, and are now 186,327 tons. The ironmasters' stocks have increased 607 tons. At present there are 91 furnaces making Cleveland iron, and 26 on hematite. The make of Cleveland iron was 172,150 tons in August, as compared with 171,466 tons in July. The production of hematite for the same relative periods was 52,309 tons, against 50,897 tons. The stocks of Cleveland iron in hand, including warrants, are 437,151 tons. The stocks are very large, and the make of iron ought certainly to be considerably reduced if any substantial advance of price is to be got.

It appears to be probable that Mr. Swan, of Newcastle-on-Tyne, will succeed in making an electric lamp suitable for coal mines. On Monday, at the British Association meeting, at York, Mr. Jamieson, of Glasgow, read a paper on the subject, and he observed that all connected with coal mines were anxious to know the commercial value of the various lamps already produced. Mr. Swan described a self-contained and portable miner's lamp, which will burn six hours by two cells of Faure's secondary battery. Sir W. Thomson said the lamp in question had excited great interest.

The inquest on the bodies of the remainder of the men killed in the explosion in the Seaham Colliery on Sept. 8 last year was opened on Wednesday. Mr. I. Bell and Mr. Willis, and the colliery officials and others, were present. Mr. Barrett, the present manager of the colliery, was examined, and he stated that the explorations in the Maundin seam were commenced on June 25, and carried on daily up to the present time. He gave a detailed list of the bodies recovered, and pointed out the parts of the mine where they had been found. All have now been recovered with the exception of one boy named Whitfield. None of those bodies in the Maundin seam had been burnt. The indications of the effects of the explosion showed it did not occur in that portion of the pit, the wind from the explosion having gone inwards. He could not fix on the site where the explosion did occur, neither could he suggest any new theory or view as to the cause of the explosion. There had been a very extensive fire near the stables in the Maundin seam, so that it was necessary to seal the workings up. Mr. N. Wilkinson, one of the Durham Miners' Union officials, also gave evidence. He was quite convinced as to the necessity for sealing up the workings. He also thought everything had been done by the owners necessary under such a calamity. This concluded the evidence, and the jury found that Joseph Cowey and others were killed by an explosion on Sept. 8, 1880; but as to the seat of the explosion there was no evidence to determine.

Thus ends the enquiry on this very serious and remarkable case. The site of the explosion, or the primary cause of it, has not been determined, and this is much to be regretted as, if those important points had been cleared up, hints might have been gleaned which might have served the purpose of preventing such occurrences in future. It must be confessed that the owners, and also the Government, were well represented in this important enquiry; but the number of men employed in this investigation—engineers, inspectors, lawyers, &c.—may have had a tendency to cause confusion. The

loss of life here was very serious, 164 men and boys having been killed, and the cost of reopening and restoring the mine to a working condition has been enormous.

The house-rent question still continues to be agitated in Northumberland, and it is very desirable that some settlement should be made of this vexed question. A large delegate meeting was held at Seaton Delaval to discuss the question last week, and a mass meeting is to be held at Horton on September 16, when Mr. Burt and others are expected to be present.

**NEW VENTILATING FAN FOR COAL AND OTHER MINES.**—We had the privilege of seeing a new fan working a few days ago at the Ginns Engine Works, Whitehaven. The inventors are Mr. C. R. Steele, of Maryport, mining engineer, Mr. J. L. Davidson, and Mr. Lyon, who are the patentees. The fan is constructed on the screw propeller system, and it exhausts the air over its whole surface instead of only in a central aperture as fans on the flat blade principle; it is reversible, and can be worked either to exhaust the air from a mine or in forcing the air down a shaft. The fan, we believe, possesses many advantages, the cost of the machine, taking any particular size, is a mere trifle as compared with the cost of a Guibal or any other fan at present in use. The machine now working is enclosed in an iron tube 6 ft. in diameter; there are four vanes similar to the blades of a screw propeller for steamers; the machine is driven by a 12 in. horizontal steam-engine, and it can be worked up to 500 revolutions per minute, but worked only at a very moderate speed this small fan will produce a current of air sufficient for the ventilation of a moderate sized colliery. The trials already made sufficiently prove this. Of course a fan of this description can be made of any dimensions required, and the price of a 6-ft. fan, with engine, &c., complete, is under 500*l*. In order to adapt it for ventilating a colliery or mine it is only necessary to connect the end of the iron tube in which the vanes work to a shaft or drift, and the air can then be extracted or forced inwards as required merely by reversing the engine. This fan will be shortly applied to the ventilation of a colliery in Cumberland, and we will again have the opportunity of noting its actual performance when at work in a mine. It must be noticed that no erections are necessary for this fan of chimney, galley, &c., to connect the fan with the downcast or upcast shaft, and the necessary erections of this kind required for the Guibal and other fans are very costly. The cost of this fan for producing, say, 100,000 cubic feet of air per minute will not, we believe, exceed 1-8th the cost of other fans for the same amount of work.

#### REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Sept. 8.—The stoppage of the Aston Hall Colliery, near Hawarden, has been the cause of much distress in that neighbourhood, as it was one of the largest collieries in the district. A relief committee has been organised, the chairman of which is Mr. William Henry Gladstone, M.P. The committee have issued urgent appeals for assistance, and the Rector of Hawarden Church, the Rev. Stephen Gladstone, has supplemented their efforts by a special appeal to the congregation.

The offices of the Flint Colliery Company were the scene of an attempted burglary on Friday. The thieves after entering the office attempted to force open the cash safe, which, however, resisted all their efforts to open, although the handle, together with a collier's pick, were found on the floor. The strike of the colliers in the employ of the New British Iron Company, and at work at their Wynn-stey pits, which we reported as commenced about a fortnight ago, has now terminated, and the men have resumed work. It will be remembered that the dispute arose through the men requiring that the masters should employ boys to convey the coal from the wicket faces to the pit bottom in lieu of the old arrangement, by which the men themselves had to do it. This the masters refused to do, but peace has been made by an arrangement by which the men are allowed additional pay for bringing out the coal. The coal trade of the district is dull, and low prices rule. The Presgweene Colliery, near Chirk, is now stopped.

The Glyn Ceiriog Granite Company (Limited) was registered on Aug. 23, with a capital of 30,000*l*, in 10*l* shares. The subscribers, of which there are six, all of them local gentlemen, each take 50 shares. The company proposes to purchase the business and property of the proprietors of the Glyn Ceiriog Granite Company, the purchase consideration being 6000*l*. in cash and 4000*l*. in shares.

#### REPORT FROM CLEVELAND AND NORTH YORKSHIRE.

Sept. 8.—At a meeting of Scotch ironmasters yesterday it was resolved to decrease the manufacture by 20 per cent., providing Middlesbrough ironmasters will do the same. Yesterday a meeting was held between a committee of the Middlesbrough Corporation and Mr. Smith, mineral goods manager of the North-Eastern Railway Company. The meeting was called to lay before Mr. Smith the reasons why the Port of Middlesbrough should be made a depot for the shipment of coal. Mr. Smith, after hearing their arguments, said he was inclined to think they had made out a good case, and that he would have pleasure in laying their reasons before the general manager. During the discussion it was stated that in the year 1846 about one and a half million tons of coal were shipped from the Middlesbrough side of the Tees alone, whereas at the present time on both sides of the river it is computed that the year's exports do not amount to more than 400,000 tons. A first meeting of the creditors in the estate of Edward Hutchinson, Auckland Ironworks, was held on Tuesday in the Queen Hotel, Middlesbrough, Mr. Wm. Whitwell, of Stockton, presiding, when a large number of creditors were present. The statement showed liabilities as follows:—Unsecured creditors, 15,333*l*. 3s. 3d.; fully secured creditors, 14,911*l*. 6s. 9d.; liabilities on unfavourable contracts, &c., 480*l*. 0s. 1d.; creditors for rents, rates, taxes, and wages, claimed in full, 609*l*. 4s. 8d.; assets, 11,414*l*. 7s. 8d. Mr. W. B. Peat was appointed trustee, and the following gentlemen as a committee of inspection—Messrs. Whitwell, Geo. Dyson, T. C. Hutchinson, Geo. Neasham, and Walter Johnson. Messrs. Hutchinson and Lucas were appointed to register the resolutions passed. The creditors were desirous that the works should be carried on in the meantime, intending to meet again within two months, and it was suggested that the debtor should arrange for making a composition so as to enable him to carry on the works. The meeting passed a vote of sympathy with the debtor, believing that he had been badly treated in one quarter.

The monthly returns of pig-iron for August issued by the Cleveland Ironmasters Association are more favourable than was anticipated, the make of all kinds of iron from the 117 furnaces in blast during the month showing only a decrease of 1096 tons over July. The shipments as compared with August last year show an increase of 12,236 tons. The publication of the returns had the effect of sending up the price of Cleveland pig iron 6d. per ton. It is hinted that some mistake must have occurred in compiling the figures, as it was fully anticipated that at the very least, with the increased make and decreased exportations, stocks should have shown 12,000 tons increase as compared with July. However, it is stated that the returns are perfectly correct. The market at Middlesbrough on Tuesday was above the average. Makers in some instances, on the strength of the favourable returns, got 37s. 6d. per ton; but the figure in a general way was 37s. per ton delivery up to next February. The warrant trade is quiet; sales were made at 37s. 6d. Messrs. Connall and Co.'s stock on Tuesday was 186,327 tons, showing decrease of 100 tons on last week, which is very satisfactory. The finished iron trade continues brisk in every department, better prices have been obtained for bars. Messrs. Whitwell and Co. have issued a circular, raising the price of their Crown brands to 6*l*. 5s. per ton. The demand for coal is very brisk, prices ranging for best steam coal from 7s. 6d. to 8s. per ton f.o.b. and, subject to 2½ per cent. discount. Little is being done in manufacturing coals, and contracts are made for good unscreened at Middlesbrough from 5s. 9d. to 6s. per ton, and for seconds 5s. 3d. to 5s. 6d. per ton; coke, 10s. 9d. per ton. Quotations are as follows:—No. 1, 40s. 6d.; No. 3, 37s.; No. 4, foundry, 35s. 6d.; No. 4, forge, 36*l*.; mottled, 35s. 6d.; white, 34s. 6d., cash. Ship plates, 5*l*. 7s. 6d. to 6*l*. Angles and bars, 5*l*. 7s. 6d. to 5*l*. 12s. 6d.; padded bars, 5*l*. 12s. 6d. to 3*l*. 15s.; rails,

5*l*. to 5*l*. 5s. per ton, all less 2½ per cent., free on trucks at maker's works.

#### THE DISCOVERY AT WHEAL GEORGE LEAD MINE.

In the Journal of Saturday last we mentioned that Capt. Absalom Francis had inspected the discovery of lead at Wheal George. Many of our readers are well acquainted with Capt. Francis, and it is scarcely necessary for us to mention that his long connection with some of the most prosperous Welsh lead mines, notably Lisburne and East Darren, gives to his report a greater value than would attach to the observations of many, perhaps indeed of all, living mining engineers. According to the report, which we now publish in full, the observation made last week that the discovery is one of the most important that has occurred in a lead mine for many years is not one whit beyond the truth.

Capt. Francis calls the discovery "very extraordinary," and says he never saw such a course of ore at the depth. He is of opinion the lode, already worth 3 tons of lead to the fathom, will improve every foot driven, and that Wheal George will open out a vast lead mine in a few months. Without discoveries in mines our vocation would cease. We are, therefore, interested in all mining discoveries, and trust the discovery at Wheal George will prove everything that is anticipated. Nevertheless, however, two heads are better than one, and the mine is only 250 miles from London. Anybody, therefore, who contemplates purchasing shares can easily visit the mine for himself, or what would perhaps be better, can send an agent to inspect for a trifling outlay. Capt. Francis too will doubtless answer any enquiries that may be addressed to him. We shall watch the development of the lode with interest, and will keep our readers au courant with the results.

#### SPECIAL REPORT ON WHEAL GEORGE.

BY CAPT. ABSALOM FRANCIS.

Gopium, Aberystwith, Sept. 3.—Agreeably with your request of the 31st ult. I lost no time in proceeding to inspect the above-named mine. It affords me unlimited satisfaction and pleasure to be able to forward the following report thereon:—Since I inspected and reported on this then virgin trial a great deal of work has been accomplished, all of which tends to show me that however sanguine my views (as to the richness of the deposits of ore likely to be found at the intersection of the different veins, at their several junctions, and with regard to which I beg to call your attention to my former report in May, 1880), the opinion I then formed was not up to what it rightly ought to have been, as the opening of the lodes, so far as they have been developed, proves them to be of the very finest and best description for producing immense courses of ore, the strata and surroundings being exceptionally good, and the matrix, gossan, and other component parts of the veins, independent of the quality of the lead ore, which corresponds with them are the finest without exception it has ever been my lot to report on during my more than 40 years experience.

The counter lode I recommended to make a trial on has been opened on for a considerable distance, the lode for the entire length showing a mass of gossan, quartz, and good stones of lead ore, and the present forecast, which spans ground rapidly in going outward, is to within a very few fathoms forming a junction with a very masterly north and south lode, and where you may almost now with certainty predict the finding of a rich course of ore at the junction, and as this level by being pressed on easterly throughout the entire distance of the grant on the counter lode, will meet with several other lodes, there is no doubt of your getting similar results at each junction as you have already found (and which I shall endeavour to describe) at the junction of the Roman lode with one of the Coed Mawr Pool lodes; but before doing so I would most earnestly advise the continuation of this adit without let or hindrance for the future, and for the reasons which are very fully set out in my former report on this property.

The very extraordinary discovery you have met with was made by opening out an adit level on one of the Coed Mawr Pool lodes (which seems to me to be a very large lode, probably some fathoms in width, composed of a mass of the most beautiful gossan I ever beheld with carbonate of lead, lime, and quartz (surface), and the Roman lode which intersects it at this place so resembles it in every way that even a practical miner would think he was dealing with the same matter, were it not for the different walls of the lodes, showing one to be a north and south lode, and the other an almost east and west lode. At the junction of these two very powerful veins, at about 4 fms. from surface, they produce such a course of ore as I never before witnessed at the depth, and I shall be within the mark in saying that in the bottom of the adit there is one solid leader of blue lead ore over 1 ft. wide, and the ore for 5 ft. wide, which is not blue lead, is mixed with carbonate of lead, lime, and gossan, and the whole mass of stuff broken from these lodes at this point shows evidence of unbounded wealth remaining in store for the fortunate shareholders in this most extraordinary property. It may not be amiss to state here, that I would advise, as the ore broken at this place is so pure and solid, that it should be selected as it is brought to day-light in lumps and sold as round ore. Two-thirds of it can be made available in this way, thus preventing any waste from water-washing and dressing cost, and the superior quality of this ore, thus treated, would bring about 2*l*. or 3*l*. per ton more than if it were treated in the ordinary way of crushing and dressing it. The advisability of getting a good temporary wooden ore bin or house will be immediately apparent, and will no doubt receive attention. As this junction and course of ore occurs so near to the surface, and the veins would seem to be drained for a long distance, and probably to a depth of from 10 fms. to 15 fms. from the dip of the ground westward towards Coed Mawr Pool, I would advise that you should at once put six men and three labourers to proceed with the sinking, which I am persuaded will improve in its productive powers every foot you deepen it, and which may now be taken at a low valuation at 3 tons per fathom, and should I have the pleasure again to visit the mine, be the time little or great, I shall expect to see such a result as the most sanguine would scarcely venture to predict or think. I think I need say no more, as it would be vain to "paint the lily."

Small rails of 14 lbs. to the yard should be laid all through your levels and intended levels underground, and a railroad laid from your mine into the main road at Betsworth-Coed, about one mile, with rails of about 20 lbs. to the yard, which could be done for 500*l*., and would enable you to send your ore to the railway station, as well as get all your supplies of materials at small cost, and which otherwise form a very expensive item of cost. There is a nice little office and smithy erected at the mine, and altogether the work has been carried out with great ability, economy, and judgement. It now remains for me to remark on the plumbago found at the back of the lodes. This, I think, can be made into a merchantable and profitable item, as well as your tailer's carb; but I would for the present advise your putting your attention to the requirements of opening out a vast lead mine, as this will require and should receive your most serious consideration, for from the nature of the ground being easily worked, and the very great richness of the courses of the lead ore, you will find a great mining property requiring most extensive working, in a few months and not one like the van, which required from the nature of the lode, some years to fully develop.

I will now conclude this report, as I did my former report, the difference only being instead of not having received a trial, "now receiving a trial," and would read thus:—"A great deal more might have been written concerning this very valuable piece of ground, but I refrain from doing so, fully believing all parties disinterested will see that I have said sufficient for believing it to be the most valuable property in the Principality now receiving a trial, and I must in conclusion congratulate you on your good fortune in obtaining it."—ABSAALOM FRANCIS.

**DOLCOATH.**—In no mine in the county of Cornwall is there such extensive machinery as there is here. At their No. 1 steam stamp they have 120 heads; at No. 2, 72 heads; at No. 3, 48 heads; with 32 more heads to be added, which will shortly be at work, making together 272 heads, in addition to which they have eight heads worked by water-power in the winter, making a total of 280 heads. Their dressing-floors are most interesting, and improvements and additions are constantly being made. At the present time they have 195 buddles and 537 frames, and they are still erecting more machinery, buddles, &c., to deal with the increasing quantity of stuff brought to surface. The number of women, men, boys, &c., employed on a mine like Dolcoath is something very considerable. The number of women on the spalling-floors is about 95; number of boys on the dressing floors, 150; number of girls on ditto about 120. The adit at Dolcoath is 26 fms. from the surface. All the buddles and frames named above are situated between the account-house and the valley below—a busy hive of industry. They are still adding to the number, and more fully utilising the space at their disposal.

**NEW MACHINERY AT EAST POOL.**—In no mine in Cornwall have the advantages of boring machinery been better demonstrated than at East Pool. But the committee are still moving on in this matter. They have recently determined to erect powerful steam machinery to compress sufficient air for working eight boring machines, and to place a man-engine rod in the engine-shaft, so as to keep the whim engine always employed in drawing stone. A contract has been concluded with Messrs. Harvey and Co., of Havre, for supplying the engines; and the masonry has been contracted for with Mr. Morgan Carkeek, of Redruth. The engine consists of two horizontal cylinders, each of 24 in. diameter, with air-compressors attached to each engine, and wheel work for giving motion to the man-engine rod. The engines are to be of a high class, condensing and cutting off the steam at the eighth of the stroke. The boilers are specially constructed for containing steam of high pressure, and are easily able to work at 80 lbs. pressure on the square inch. The object aimed at is of course economy of fuel. The whole of the arrangements are being carried out under the superintendence of Mr. F. W. Michell, the engineer of the mine.—West Briton.

The liability of evil effects from the chemical action of acids and salts, in the substances packed in tin cans, has for a long time been a serious drawback to the canning and packing industry in England and America, and much study has been devoted to the subject of an improved material. A firm at Dunstable, Bedfordshire, it is said has invented a method of coating tin-plates with a material which imparts a film resembling glass between the surface of the metal and the fruit or other contents. The insoluble portion of the composition is silicate of lime or fluo-silicate of lime (glass powder) previously acted on by fluoric acids; the soluble portion being silicate of soda and potash. Preferably that kind of silicate of lime is used which has been produced by double decomposition from polysulphide of calcium.



Thereat, 13,000 Pecu Billiton offered in public sale at Batavia on the 23rd inst., fetched the average price of 61-90 fl., costing to sell hereabout 55 1/2 fl. by steamer.

Next sale comprising the same quantity will be held on Oct. 25. The position of Banca tin in Holland on Aug. 31, according to the Official Returns of the Dutch Trading Company, was—

	1881.	1880.	1879.
Import in August.....Slabs	11,190	8,363	10,807
Total eight months	96,756	83,912	99,965
Dividends in August	1,633	1,036	16,274
Total eight months	104,389	84,948	116,239
Stock second hand.....	25,749	40,019	45,922
Unsold Stock	61,735	50,815	32,836

IRISH MINING AND MISCELLANEOUS COMPANIES' SHARE  
MARKET.

These combined returns of Banca and Biliton for 1881, compared with those for 1880, exhibit—A decrease of the import for August of 244 tons; a decrease of the import for the eight months of 6 tons; an increase of the deliveries for August of 91 tons; an increase of the deliveries for the eight months of 709 tons; a decrease of the stock second-hand of 1033 tons; an increase of the unsold stock of 341 tons; a decrease of the total stock of 742 tons; an advance of the quotation of Banca of 16s. per ton.

The Government Returns for the months of June are as follows:—

EXPORT OF TIN FROM HOLLAND.						
	For June.			For Six Months.		
	1881.	1880.	1879.	1881.	1880.	1879.
To Germany .....	Tons 238	322	198	1779	1791	1339
England .....	12	44	1	275	788	371
Belgium .....	115	316	—	983	1619	633
France .....	41	130	43	338	386	190
Hamburg .....	56	67	31	349	440	359
The United States ..	27	—	125	37	368	109
Other countries.....	111	187	60	306	493	75
Total .....	603	1067	458	4067	5802	3076

Messrs. HENRY R. MERTON and Co. (Leadenhall-street, Sept. 1)  
 issue the following Statistics of Copper:—

Stocks in Europe	
Chili ores and regulus, Liverpool and Swansea (fine).....	Tons 2,022
Chili bars in Liverpool .....	17,162
Chili bars in Swansea .....	9,749
Chili ingots in Liverpool and Swansea .....	193
Foreign copper (chiefly Australian) in London .....	8,182
Foreign copper .....	210
Chili bars and ingots and barilla in Havre.....	4,519
Other copper in Havre .....	1,120
Stocks of copper contained in other foreign ore and Spanish Preci-	
metized fine Chili to Europe (advised by mail).....	1,474
Afloat, and chartered fine Chili to Europe (advised by mail):	
Ore and regulus (fine) .....	1,337
Bars and ingots .....	4,814
By cable, ores and regulus (fine) .....	600
Bars and ingots .....	2,100
Afloat from Australia (advised by mail):	
Fine copper .....	1,729
By cable: Fine copper .....	734

Total.....	58,003
Price of bars, 59¢ : Wallaroo, 66¢ : English tough, 34¢.	

Messrs. HARRINGTON, HORAN, and Co (Liverpool, Aug. 13).—On the 25th inst. Chill copper charters were advised as 700 tons fine, of which 450 tons bars and ingots for England, and 250 tons bars for Continent. Chill bar market during the past fortnight has been rather depressed, owing to the advances in the bank rate and apprehensions of dearer money, consequently business in the article has been almost at a standstill until the latest issue of the day, when more animation set in. The following table comprises 50 tons of Chill regular copper, viz., 12 tons per Varrador 12s., 363 tons Bolivian ore at 11s. 9d., and 438 tons Bolivian regulus at 12s., per Carmelita at Swansea, 40 tons Battle Mountain ore at 11s. 9d., 12 tons Peruvian ore at 11s. 9d., 653 tons Quebrada regulus and 120 tons Canadian regulus at 11s. 9d., 320 tons Quebrada ore (ruby) at 11s. 9d., and 442 tons (yellow) at 11s. 7½d., 200 tons Newfoundland ore at 11s. 7 per cent., 50 tons English precipitate (producers works) at 12s., 460 tons Rio Tinto at 12s. 1½d., 217 tons Mason's Spanish at 12s., 568 tons Mason's (low producers) at 11s. 10½d., and at the Swansea sale by tender 1626 tons ores average produce 8½ per cent. realised 10s. 9½d. per unit.

For so many years past the miners' surveying instruments manufactured by Messrs. JOHN DAVIS and SON, of Derby, have been so well known to the profession that it is only necessary to mention the firm to notice the improvements in detail from time to time introduced to bring the instruments still more closely to absolute accuracy and perfection, to suit the varied conditions of mine surveying. The Hedley dial, which was brought out by the firm about 30 years ago, was considered the perfection of a miner's circumferenter. The original construction has never been deviated from, but from time to time many improvements have been made to render surveying with this instrument so accurate that the work executed may be equal to that of a theodolite. The minutest attention has been paid to every detail of these dials, even the proper weight and size of each screw has been well considered—metal has been added where strength is required, and removed where unnecessary. The great success of the dials is, no doubt, especially due to the valuable ideas given by surveyors of great practical experience. There is no branch of the business of the firm that has received more careful attention, and it is very gratifying that the Hedley dials are universally adopted in all coal-getting countries in the world.

Amongst the most recent improvements in Davis's improved Hedley dial it may be mentioned that by a special arrangement of the plates a vernier placed on the outside circumference reads simultaneously with the needle. This in itself is of immense advantage, besides which other objects are obtained—the vernier may be more easily read, as the necessity of raising the head above the dial-face is obviated. The concentricity of the dial-plates may be ascertained by setting the needle and vernier to  $360^\circ$ , and then revolving the plates by means of the vernier screw and reading off (say) the four quarters. The old form of quadrant has been entirely reconstructed. The new arc is a fixture, and consists of a circular box  $1\frac{1}{2}$  in. diameter, with a hand traversing over a dial-plate divided into  $90^\circ$ . The new arc is always there when wanted, never in the way, and greater accuracy in reading is possible than with the moveable form.

For facilitating setting up the instruments and for obtaining greater accuracy in levelling an American invention, the Hoffman patent joint, has been adopted. This invention combines the play of the ball and socket joint, and the rigidity and accuracy of the parallel plates. This combination has always been desired, and Messrs. Davis and Son have been fortunate in securing the patent rights for England, France, and Belgium. In addition to the above named advantage we may mention that with this joint the instrument is more compact and the plummet is suspended from the true centre of the dial, which cannot be effected with the ball and socket joint. For very elaborate surveys a powerful telescope is supplied in addition to, and interchangeable with the sights which enable the surveyor to take longer and more accurate sights, and execute work equal to that done with a dumpy level.

Amongst minor improvements may be mentioned the new form of skeleton limb or frame, which, while being lighter, is stronger than the solid section—a more solid clamp for securing the limb to the body. Greater rigidity is obtained in the legs by increasing the diameter towards the centre. Also all joints in the legs are made interchangeable.

**CAPE COPPER.**—The directors at a meeting on Wednesday declared a dividend of 20s. per share, free of income tax, payable on Sept. 29.

**PATENT AUTOMATIC KNITTING MACHINE COMPANY.—**Aston  
COAL AND BRICK COMPANY.—Petitions have been presented to the High Court  
of Justice for the winding up of the above undertakings.

Vice-Chancellor Bacon has appointed Mr. Fred Maynard official liquidator of the Tumacacori Mining and Land Company (Limited).

**HOLLOWAY'S OINTMENT AND PILLS.**—Whenever the weather is variable and the temperature constantly changing, the weak and delicate must be very careful to neglect no symptoms of disordered action or ill health. Weak chested and straggled aged individuals and in these no less remedies the means of curing or the bad humours which originate and prolong their sufferings. The ointment should be well rubbed twice a day over the chest and the pills taken in alternate doses. It will penetrate and absorb most wholesome and energetically on the diseased structure. These remedies manifest a wonderful power in removing all taints from the blood and consequently in curing a multitude of chronic ailments which seemed to be almost irremediable.

**CORNISH MINE SHARE MARKET.**—Mr. S. J. DAVIEY, mine shareholder, Redruth (Sept. 8), writes :—A moderate business has been done in our market during the week. West Kittys, New Kittys, and Killifreths have been in particular request, and have each risen 1. Prices of other shares continue without much alteration. Market is dull to-day with very little doing. Prices are as follows:—Blue Hills, 2½ to 3; Carn Breva, 23½ to 25½; Cook's Kitchen, 20½ to 20¾; Dolcoath, 78 to 78½; East Pool, 38½ to 38¾; Killifreth, 36s. to 35s.; Mellanear, 4 to 4½; New Cook's Kitchen, 6¼ to 7; New Kitty, 33s to 35s.; Penhalls, 1¼ to 1½; Pedn-an-drea, 4 to 4½; Tincun Condourro, 9½ to 10; South Crofty, 5s to 5¼; South Francis, 14½ to 14¾; Thoresford, 18½; West Kittys, 11½ to 12; West Pool, 14½ to 15; West Poldice, 6½ to 12½; West Seton, 17 to 19; Wheal Agar, 14½ to 15½; Wheal Bassett, 4½ to 5; Wheal Comford, 2 to 2½; Wheal Grenville, 9½ to 9¾; Wheal Pevor, 14 to 14½; Wheal Kitty (St. Agnes), 1¼ to 2; Wheal Prussia, 1s to 1½; Wheal Trevellick, 3½ to 4; Wheal Boys, 2 to 2½; West Polbrean, 13s to 13½.

— Mr. J. H. REYNOLDS, stock and share broker, Redruth (Sept. 8), writes:—  
A good business has been done during the week in all the leading shares including  
Dolcoath, East Pools, Carn Brea, Tincroft, South Frances, West Bassett, and  
Wheal Agar. West Kittys, New Kittys, West Polbreens, and Killirethra, also in  
demand at higher prices. Subjoined are the closing prices:—Blue Hills, 2½ to 3; Carn Brea, 25¼ to 25½; Cook's Kitchen, 20¼ to 20½; Dolcoath, 77½ to 78½; East Pool, 38 to 38½; East Blue Hills, 1¼ to ½; Marke Valley, 1 to 1¼; Mellanor, 4¼ to 4½; New Cook's Kitchen, 6½ to 7; New Kittys, 3¼ to 3½; Killirethra, 1½ to 2½; North Herodcroft, 10s. to 12s. 6d.; Pedn-ar-drea, 4 to 4½; Phenix, 3¼ to 3½; Penhalls, 1½ to 1¾; South Condour, 9½ to 10; South Crofty, 8½ to 9; South Crofty, 14½ to 15½; South Lincour, 1½ to 2½; Tincroft, 18½ to 19; West Bassett, 14 to 14½; West Frances, 12 to 12½; West Kittys, 10 to 11; West Pevoor, 14½ to 15; West Polbreen, 1½ to 1½; West Toldred, 6½ to 7; West Seton, 18 to 19; Wheal Agar, 14½ to 15½; Wheal Bassett, 4½ to 5; Wheal Boys, 2¼ to 2½; Wheal Grenville, 9 to 9½; Wheal Jewell, 8s. to 10s.; Wheal Unity, 2 to 2½; Wheal Pevoor, 13½ to 14½; Wheal Prussia, 1¼ to 1½; Wheal Uny, 1¼ to 2.

— Messrs. ABBOTT and WICKETT, stock and share brokers, Roth (Sept. 8) write:—In the past week there has been a good demand for Dolcoath, Tinroths, and Cook's Kitchens, and in each case a sharp advance has been maintained, and they close at their best. New Kittys, West Kittys, and Killifreths have been largely dealt at higher rates. With the probability of cheaper money and a higher price for metals it is but reasonable to expect that the public will soon be inclined to invest in Cornish mines. Closing quotations annexed:—Blue Hills 2½ to 3; Carn Breva, 25½ to 25½; Cook's Kitchen, 20½ to 20½; Dolcoath, 78 to 78½; East Pool, 38½ to 38½; Killifreth, 1¼ to 2; New Kittys, 3½ to 3½; New Cook's Kitchen, 36 to 7; North Bury, 4 to ½; Pedu-an-drea, 4½ to 4½; Santa Gertrude, 170 to 175; South Cornwall, 1½ to 1½; South Crofty, 7½ to 8½; South Crofty, 12½ to 13½; Tinroths, 48½ to 49½; West Kittys, 12½ to 12½; West Fildice, 6½ to 7; West Pevor, 14½ to 15; West Frances, 11 to 12; West Seton, 18 to 19; Wheal Agar, 15 to 15½; Wheal Bassett, 4½ to 5; Wheal Boys, 2 to 2½; Wheal Gravelly, 9 to 9½; Wheal Kitt, 2 to 2½; Wheal Pevor, 14 to 14½; Wheal Prussia, 1¼ to 2; Wheal Uny, 1¼ to 2½; West Kittys, 10½ to 11½; West Providence, 1¼ to 1½; West Polbrean, 1½ to 1½.

-- Mr. M. W. BADEN, Liskeard (Sept. 8), writes:--The mining market has been decidedly firm throughout the week, and a steadily business effected in most of the best dividend and progressive mines, and prices are well maintained in anticipation of a permanent advance on the New West Caradon in demand on cutting the lode good at the 48 fm. level, worth  $\frac{3}{4}$  tons of copper ore to the fathom. Subjoined are the closing prices:--Bedford Union, 1½ to 2; Carr Brea, 25 to 25½; Cook's Kitchen, 20 to 20½; Dolcoath, 76 to 77; Devon Consols 8 to 8½; Pevon Great United, ¾ to 1; East Caradon, ¾ to ¾; East Crebor ¼ to ¾; East Herodsfoot, 1 to 1½; East Pool, 37½ to 38; Gawton United ¾ to ¾; Glasgow Caradon, ¾ to 1; Gunnislake (Clitters), 3 to 3½; Herods foot, ¼ to ½; Hington Down, 1 to 1½; Marke Valley, 1¼ to 1½; New West Caradon, ¾ to ¾; North Herodsfoot, ½ to ¾; Old Gunnislake, ¾ to ¾; Phenix United, 3¼ to 4; Prince of Wales, ¾ to ¾; South Caradon, 38 to 40; South Condarrow, 9½ to 9½; South Crebor, ½ to ¾; South Crofty, 9½ to 9½; South Devon United, 1¼ to 2; South Frances, 14½ to 15; Tincroft, 18½ to 19; West Bath, 10 to 10½; West Breidden, 14 to 14½; West Breidden, 11 to 11½; West Mary Ann, 1 to 1½; West Pevor, 14 to 15; West Phoenix, 1 to 1½; West Seton, 18 to 18½; Wheel Agar, 15 to 15½; Wheel Bass, ¾ to 5; Wheel Crebor, 3½ to 3½; Wheel Grenville, 9½ to 10; Wheel Honey and Trevelyan 2 to 2½; Wheel Kitty, 1½ to 2; Wheel Jane, ¾ to ¾; Wheel Pevor, 14 to 14½; Wheel Ury, 2 to 2½.

— Mr. JOHN CARTER, mine shareholder, Camborne (Sept. 8), writes:—"The share market has been rather firmer during the last few days with West Kittys new Kittys, West Kittys, and Killifire chiefly in request. Further improvement is expected in the former mine; the 50 fms. lead west is now reported to be worth 80¢ per fathom. Shares have changed hands up to 11. New Kittys is sympathy have improved to 3½, call paid. At Killifire a good lode has been cut in the shaft, which will produce 1 ton of tin per fathom. Other points in the mine have also improved, and the shares have been eagerly bought up. Price improved to 35s. to 40s. There is no change in the tin standards. Closing prices are annexed:—Blue Hills, 2¼ to 2¾; Carn Brea, 25¼ to 25½; Cook's Kitchen, 20 to 20½; Dolcoath, 75 to 78½; East Pool, 38 to 38½; East Blue Hills 75 to 85; Killifire, 36s. to 38s.; Mellanear, 4 to 4½; New Cook's Kitchen, 6½ to 7½; New Kittys, 3½ to 3½; Penhalis, 1½ to 1¾; Pedn-ar-nah, 4 to 4½; South Croft, 40 to 50; South Conduvor, 13½ to 14; South Crofty, 8½ to 9; West Kittys, 10 to 11; Tincroft, 18½ to 19½; West Basset, 14½ to 14½; West Frances, 12 to 12½; West Peavor, 14 to 15; West Poldoc, 14 to 15; West Kittys, 10½ to 11½; Wheal Agar, 15 to 15½; Wheal Basset, 4½ to 5; Wheal Grenville, 9 to 9½; Wheal Peavor, 13½ to 14; Wheal Kitty, 1½ to 2; Wheal Ugn, 1½ to 2.

MANCHESTER.—Messrs. JOSEPH R. and W. P. BAINES, sharebrokers Queen's Chambers, Market-street (Sept. 8), write :—The more propitious weather which has been experienced since our last report coupled with the cessation of the drain upon the bank, has given a better tone to the markets generally, so that we have to record better prices as ruling—at any rate as regards the leading securities—and a more buoyant tone than was the case a week ago. The weather "taking up" when it did save a good portion of the crops of this country from the irremediable loss that was threatened and made it possible to gather in a large amount of produce with, had the bad weather continued, would have been rendered entirely worthless, so that, although probably the costs of breadstuffs to the public might not have been so much materially influenced, owing to the foreign supplies, the saving to the country is no doubt very considerable, and the general prosperity of the country will be furthered by the amount. Though the feeling has been better, and prices are in the majority of cases, better, the business done is of only moderate amount, much caution being observed as to entering on large operations.

BANKS.—The business herein bears a very favourable proportion to the aggregate of transactions recorded, and figures realised show no falling off in prices. Quotations are not much altered, but what changes there are exhibit a slightly better state. Higher—Lancashire and Yorkshire Bank,  $\frac{1}{2}$ ; Consolidated Bank,  $\frac{1}{2}$ . Lower—Manchester and Salford Bank,  $\frac{1}{2}$ ; Union Bank of Manchester, and Manchester and County, each quoted a trifle better on buyers' prices, but sellers' figures remain unaltered.

In Insurance shares the movements, both as regards quotations and business done, are very meagre, the latter being confined to a few solitary transactions and the former exhibiting changes as follows:—Higher: Liverpool and London and Globe,  $\frac{1}{4}$ ; Maritime,  $\frac{1}{16}$ .—Lower: Royal Liverpool,  $\frac{1}{2}$ ; and Manchester and London Fire,  $\frac{1}{8}$ . Royal Liverpool has been a trifle lower during the week, and at one time Thames and Mersey Marine showed a fractional decline, but both have rallied slightly.

**COAL, IRON, &c., D. MINING.**—Though producing no business whatever excepting in Bolckow and Ellbow this market on comparison of quotations quoted last week prices are irregular. Bolckow fully paid are credited with a substantial rise, but they are still at a discount. Indian gold mining companies' shares nearly all show higher prices. Higher Bolckow full, 10; Indian Sulphur, 6½; Ellbow Vade, ½; Indian Phenix Gold, ¾; Indian Glenrock, 1½; Indian Sulphur, 1½; United States Rolling Stock, ¼; South Indian Gold after having been a ½, 1½; figures rising a week since. Lower—Telegraph Construction and Maintenance, 1½; American Telephone & Cable Building, 1½; John Brown and Co., ¼; Bolckow, Vaughan (122 paid), 1½; Canadian Pacific, 1½.

**COTTON SPINNING AND MANUFACTURING.**—Notwithstanding the fact that movements of cotton are still inapparent in this market, and prices are maintained very fairly, and in some instances are being advanced, a sturdy resistance to the cotton "operators" is advocated, and drastic measures are confidently suggested, which shall not only clear away present obstacles, but if persevered in will, doubtless, render operations so unfavourable to the spinners and manufacturers' interests, all but impossible in the future.—TELEGRAPHICALLY better than the rest of the week.—CANALS AND CORPORATION STOCKS, &c., are practically unaltered.

Monday figures began to show a decided movement, and on Tuesday Scotch and Canadian stocks came into favour on the announcement of the 1890 dividend of 2½ per cent., with 26,000. over, against 3½, and 10,801. over last year. Calcutta, Bombay and North British are foremost in the advances, neither, however, having maintained the best figures marked. In Canadians Trunks of all issues are rather better, the Third and Fourth showing greatest rise; Great Western of Canada, 10,000. higher, and 10,000. higher. In American issues, Irregular, Erling being 8½ higher, and Readings and Onlos rather lower.

HULL.—Mr. W. FOWLER SUTTON, stock and share broker, St. Mary's Chambers (Sept. 8), writes—With a cessation of the drain of gold and finer weather the railway markets have shown more steadiness, and the tone is greatly improved. The feature of the market has been the Caledonian dividend, which is considerably better than was expected, and the stock has consequently had a sharp rise. Canadian stocks are firmer, and only require a rally to initiate a smart rally. American stocks uncertain and very variable, but higher prices are confidently expected shortly. The Paris Bourse settlement having been safely tied over, has helped the foreign market, and nearly all descriptions are had at higher prices. Local stocks unchanged. Hull Banks, 12½; London and Yorkshire,

CORK.—MESSRS. J. H. CARROLL AND SONS, stock and share brokers, South Mall (Sept. 7), write:—Great Southern were done at 109, and Midland at 83½ to 84. To-day Bandons were asked for at 81½, and Macrooms offered at 6½. No change in Passages. National Banks changed hands at 68½, and Hibernians at 42½. Munsters were also done at 7½. No change in Provincials. Cork Steam Packets were more enquired for, and Gas shares were done at 6½. Lyons shares remain 4½, and Gouldings 7½ to 9. Harbour Board debentures wanted at 102½.

**COPPER AND TIN.**—Messrs. RICHARDS and BUDD (Sept. 8) writes: "The large reduction in total stocks shown on Sept. 1, together with a fair demand for Chili bars for consumption and export, and some good orders for manufacture of copper wire, has caused us to strengthen our position in the market, and the price of bars has advanced to 50*l.* per ton. Unless money should again be dearer, we think rates are likely to advance more in connection with the usual autumn demand. Under the influence of an enormous demand for tin especially for English, pipes are creeping up, and there appears no reason in statistics to suppose that tin will not advance still higher."

METALS.—Messrs. FRY, JAMES, and Co. (Sept. 8) write: Copper has become in better demand, and rather more prices are obtainable for foreign. Chilean has advanced 1s. per lb. since our last, and Australian has improved to about the same extent. Reduction of about 3000 tons shown in the stocks on the 1st inst. has contributed to this firmer condition. Tin also has recovered in tone to-day's prices being 10s. advance on the opening of the week, and a good deal of fine foreign has changed hands. Lead is fairly steady in value, with but little doing. Spelter is rather firmer, and in moderate request.

Mr. J. R. Scott, the Registrar of the London Coal Market, has published the following statistics of imports and exports of coals into and from the port and district of London, by sea, railway, and canal during August, 1881:—

By Sea.	Ships.	Tons.	By Railway and Canal.	Tons ewt.
Newcastle .....	143	132,447	London & North-Western .....	125,405 9
Sunderland .....	85	58,916	Great Northern .....	89,295 0
Seaham .....	38	22,379	Great Western .....	76,183 0
Hartlepool .....	55	23,059	Midland .....	161,005 0
Middlesbrough .....	5	3,853	Great Eastern .....	45,148 10
Scotch .....	13	5,746	South-Western .....	5,738 11
Welsh .....	24	30,470	South-Eastern .....	1,582 8
Yorkshire .....	21	12,677	Grand Junction Canal .....	710 10
Small coal & clinders .....	13	5,721		
Colonial .....	13	892		

Total .....	425	236,150	Total .....	505,071	8
Imports—Aug. 1880	427	272,163	Imports—Aug. 1880	449,728	12

Imports—Aug., 1880		Imports—Aug., 1880	
Comparative Statement, 1880 and 1881.		Comparative Statement, 1880 and 1881.	
By Sea.	Ships. Tons.	By Railway and Canal.	Tons. c.
Jan. 1 to Aug. 31, 1881	3313...2,391,800	Jan. 1 to Aug. 31, 1881	4,203,596 13
Jan. 1 to Aug. 31, 1880	3417...2,323,878	Jan. 1 to Aug. 31, 1880	3,925,247 6
Increase—1881 .....	67,922	Increase—1881 .....	278,349 7
Decrease—1881 .....	97 ..—		

## EXPORTS

Railway-borne coal passing "in transitu" through district.....	Tons	92,416
Sea-borne coal exported to British Possessions, or to foreign parts, or to the coast .....	64,545	
Ditto sent beyond limits by railway .....	18,606	
Ditto by canal and inland navigation .....	2,193	85,834
Railway-borne coal exported to British Possessions, or to foreign parts, or the coast .....	32,143	
Ditto by canal and inland navigation .....	269	32,412
Sea-borne coal brought into ports and wharves .....		1,286
Total quantity of coal conveyed beyond limits of coal duty district during August, 1831 .....		211,460
Ditto, during August, 1830 .....		177,229

*Comparative Statement. 1830 and 1831.*

## coal from Jan. 1 to Aug. 31, 1881

Total distribution of coal from Jan. 1 to Aug. 31, 1880.....	1,554,203
Increase in the present year .....	188,965

<i>General Statement, 1880 and 1881.</i>		
Increase in coals imported by sea .....	67,922	
Increase in coals imported by railway .....	278,349	= 346,271
Deduct increase in coals exported .....		188,968
<b>Total increase in trade within the London district—1881 .....</b>	<b>157,303</b>	

THE TIN TRADE.

Messrs. STRAUSS and Co. (London, Aug. 31) issue the following

Statistics of Tin:	Aug. 31, 1881.	Aug. 31, 1880.	Aug. 31, 1879.
Straits and Australian, spot.....Tons	7,119	7,037	9,521
" " do " do " do " do " do "	428	468	203
Straits, afloat " " " " " " " "	25	210	230
Australian afloat " " " " " " " "	1,481	1,739	1,296
Banca, on warrants .....	809	1,250	1,455
Billion, spot " " " " " " " "	1,465	1,465	2,123
" afloat " " " " " " " "	1,050	1,300	800
" " tin in Holland .....	—	200	210

Total .....	12,334	14,244	15,958
Prices of Straits and Australian .....	£90 5	£87 0	£62 10
Deliveries during month in London .....	1,278	859	1,053
Holland .....	718	545	336

Total .....	1,666	.....	1,404	.....	1,895
Shipments during the month from Straits .....					Nil.
" " Australia .....					850 tons.
					<b>During twelve months,</b>

	1881.	1880.
Shipments from Straits to London .....	4,636	1,640
Shipments from Australia to London .....	8,335	8,096
Deliveries of tin in London .....	14,112	12,287
Deliveries of tin in London and Holland .....	22,577	19,338
Banca in Trading Company's hands and afloat, 2301 tons.		

Prices: Straits and Australian, spot, 90/ 5s.; afloat, 91/ 5s. English common ingots, 95/; refined, 97/. Banca, 90/ 15s.; Billiton, 90/.

Stocks of all kinds of tin in American ports (including quantity afloat), July 31, 1900, 1,000,000 lbs.

1881, 2950 tons; Aug. 31, 1881, 3222 tons Aug. 31, 1880, 6570 tons.

MESSRS. EEBELING and HAAVELAAR (Rotterdam, Aug. 31) state:—

There was considerable firmness in our tin market during the first part of this month, and with an active trade demand prices advanced  $\frac{1}{2}$  ct. at fl., with a further tendency to rise, but the market was somewhat unsettled by the fact that the London Bank rate and the less favourable harvest prospects, which caused operators to deal with some caution, and induced holders to accept lower prices. Our final quotations vary but little from those ruling at the end of July. The statistical position of the article remains very strong, consumption continuing on as large a scale as ever. Banca has been in continued good request, the price advancing from 54½ ct. to 55½ ct., from which we again declined to sell, and the market has been somewhat unsettled by the fact that prices have been comparatively steady, the same being being exceedingly well held. After advancing from 54½ ct. to 55½ ct. the price came, way to 54 ct., closing with many buyers.



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Hadfield's Sheet of Drawings, No. 28.

# HADFIELD'S STEEL FOUNDRY COMPANY.

## ATTERCLIFFE, SHEFFIELD.

GOLD MEDAL.



Special Award, Paris, 1878.



Contractors to H. M. Home, India, and Colonial Governments;  
Home, Foreign, and Colonial Railways; Admiralty,  
War Department, &c.

GOLD MEDAL.



Special Award, Melbourne, 1880.

FIRST PRIZES AT LEEDS AND MANCHESTER, 1875. FIRST PRIZES AT LEEDS AND CORNWALL, 1876.

X SPECIAL AND HIGHEST AWARD AT SYDNEY, 1879, DIPLOMA &amp; MEDAL. X

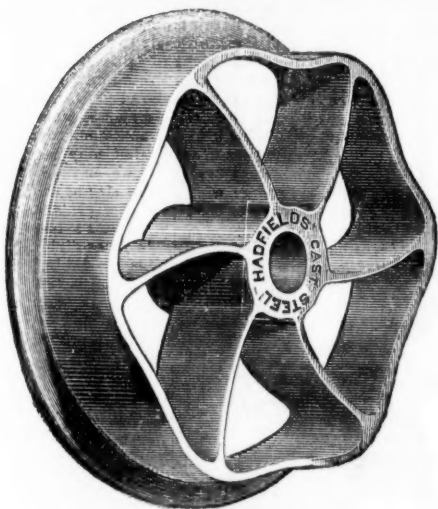
### ▶ HADFIELD'S CAST STEEL WHEELS. ◀

One of our departments is specially adapted for the production of our Patent Steel Wheels and Axles for Collieries, Tramways, Ironstone Mines, Slate Quarries, Ironworks, Lead Mines, &c., and we are now manufacturing 2000 per week. Owing to our patent system of fitting-up Wheels and Axles, which is simple but effective, we are enabled to execute orders with promptitude. We undertake to supply all work entrusted to us in a first-class manner, and only manufacture the BEST quality of material. Over 1100 DIFFERENT WHEEL, PULLEY, AND PEDESTAL PATTERNS IN STOCK, of varying widths of tread, flanges, &c., any of which can be ready for use at the shortest notice.

In addition to the now universally admitted superiority of Hadfield's Steel Wheels over those of Cast-iron for lightness, strength, and wearing qualities, we claim the following SPECIALITIES for our material over any other Steel, Malleable Iron, or other Wheels: Extra TOUGHNESS or TENACITY, DURABILITY, and SOLIDITY; for proof of this kindly read the undermentioned.

X

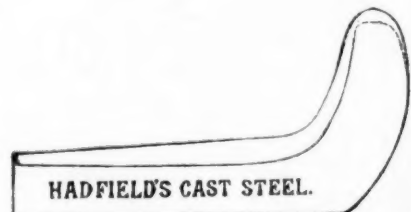
#### TOUGHNESS



X This view represents one of Hadfield's Steel Wheels taken out of stock, bedded upon an anvil (thus getting full force of blow), then hammered COLD with no less than 45 swinging blows of a 14 lb. steel sledge hammer. We undertake that this same wheel, which may be seen at our Works, can be heated in a smith's fire, straightened, and put to use again; or if desired, a piece therefrom drawn out into a chisel, knife, &c. This only represents an ordinary specimen of our manufacture.

Special attention is drawn to the slight indentations produced by the numerous and heavy blows, thus bearing out our claims for producing a special tough and tenacious steel, which will not break or bend easily out of shape, and thus withstand the rough usage experienced at collieries, &c.

#### DURABILITY



Section taken from a wheel kindly furnished by a customer who has many thousands at work. This wheel has run 41,000 miles, carried nearly 10,000 tons of coal, and although at work almost night and day for over five years, is only worn so slightly as shown above—viz., one-eighth of an inch! The wheels in question were 9 inches diameter, and weighed only 14 lbs each when put to work. This is only one out of many similar examples of the extraordinary durability of our material.

Prices per set furnished on receipt of sizes, either for wheels only or fitted together with Steel Axles by our well-known patent fast method. When so fitted by us we undertake that our wheels shall remain fast as long as the wheels and axles last. Upwards of half-a-million are now in daily use fitted by Hadfield's patent fast method. This is the only system that successfully withstands the great strains experienced in collieries, &c., without working loose.

NOTE.—Beware of spurious and cheap imitations which eventually work loose, causing great loss and annoyance, as well as bringing discredit on the name of Steel Wheels and Axles. We are constantly replacing such. See, therefore, that Hadfield's name is on every Wheel.

We also solicit attention to the following articles, which, in addition to our well-known Patent Steel Wheels and Axles, we are now largely supplying in our CAST STEEL, on account of their great strength, combined with durability and lightness.

**Rollers, Pulleys, Frames, and Stands.**—See our Lists of over 160 different patterns. They possess great durability, lightness, and strength, and add considerably to the life of the steel and other ropes.

**Self-oiling Wheels (Patent).**—Many thousands now at work. Save at least 50 per cent. of oil or grease. Easily charged or re-filled. Reduce friction and wear and tear to a minimum.

**Pedestals, Bushes, Cage Guides, Buffer Boxes, Points, Crossings,** and other Colliery Castings of every description.

Over 1100 different patterns of above in stock, ready for use on the shortest notice. New patterns made to suit special requirements free of charge for quantities.

**Steel Axles** to suit all classes of haulage. We manufacture a special mild quality of steel suitable for this purpose, but have many hundreds of thousands in daily use, giving every satisfaction.

**Steel Gearing** of all kinds. Machine moulded, or from full patterns.

**Miscellaneous Steel Castings**, up to 16,000 lbs. each, to replace expensive wrought-iron and steel forgings and heavy iron castings. Tensile strain of our castings 34 to 40 tons per square inch, as tested by Government.

NOTE.—Beware of spurious and cheap imitations which eventually work loose, causing great loss and annoyance, as well as bringing discredit on the name of steel wheels and axles. We are constantly replacing such. See, therefore, that Hadfield's name is on every wheel.

N.B.—Note the Address, and prove truth of the above by giving our Steel Wheels, &c., a trial.

### HADFIELD'S STEEL FOUNDRY COMPANY, HECLA WORKS, ATTERCLIFFE, SHEFFIELD.

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Hadfield's Sheet of Drawings, No. 28.

DYNAMO-ELECTRIC MACHINES SPECIALLY CONSTRUCTED FOR DECOMPOSITION.



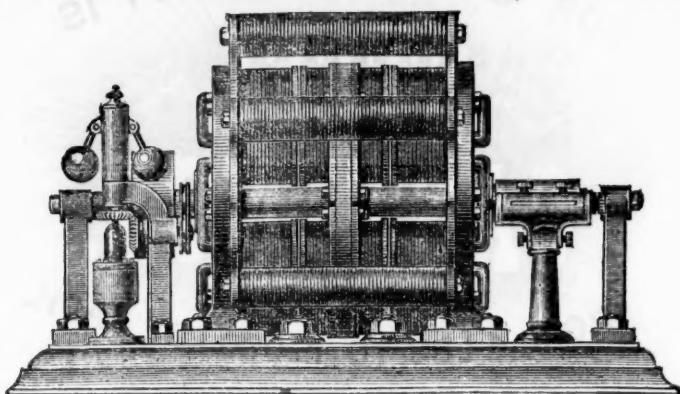
THE DYNAMO-ELECTRIC MACHINE SUPERSEDES EVERY KNOWN BATTERY.

# WILLIAM ELMORE,

## 91, BLACKFRIARS ROAD, LONDON, S.E.

NO OTHER ADDRESS.

PRICES AND  
PARTICULARS  
GIVEN ON  
APPLICATION.



NO AGENTS.

ALL APPLICATIONS  
SHOULD STATE  
THE PURPOSE  
FOR WHICH THE  
MACHINE IS REQUIRED.

### The "Elmore" Patent Dynamo-Electric Machine,

FOR DEPOSITING

NICKEL, SILVER, BRASS, BRONZE, COPPER, ETC., AND FOR ELECTROTYPING.

REPEATED COMPARATIVE TRIALS have proved that this is the MOST POWERFUL MACHINE IN THE MARKET, that it NEVER REVERSES CURRENT, and that it is very easily worked without special knowledge.

COMPLETE OUTFITS OR MATERIALS FOR NICKEL-PLATING, SILVER-PLATING, ELECTROTYPING, TINNING, BRONZING, &amp;c.

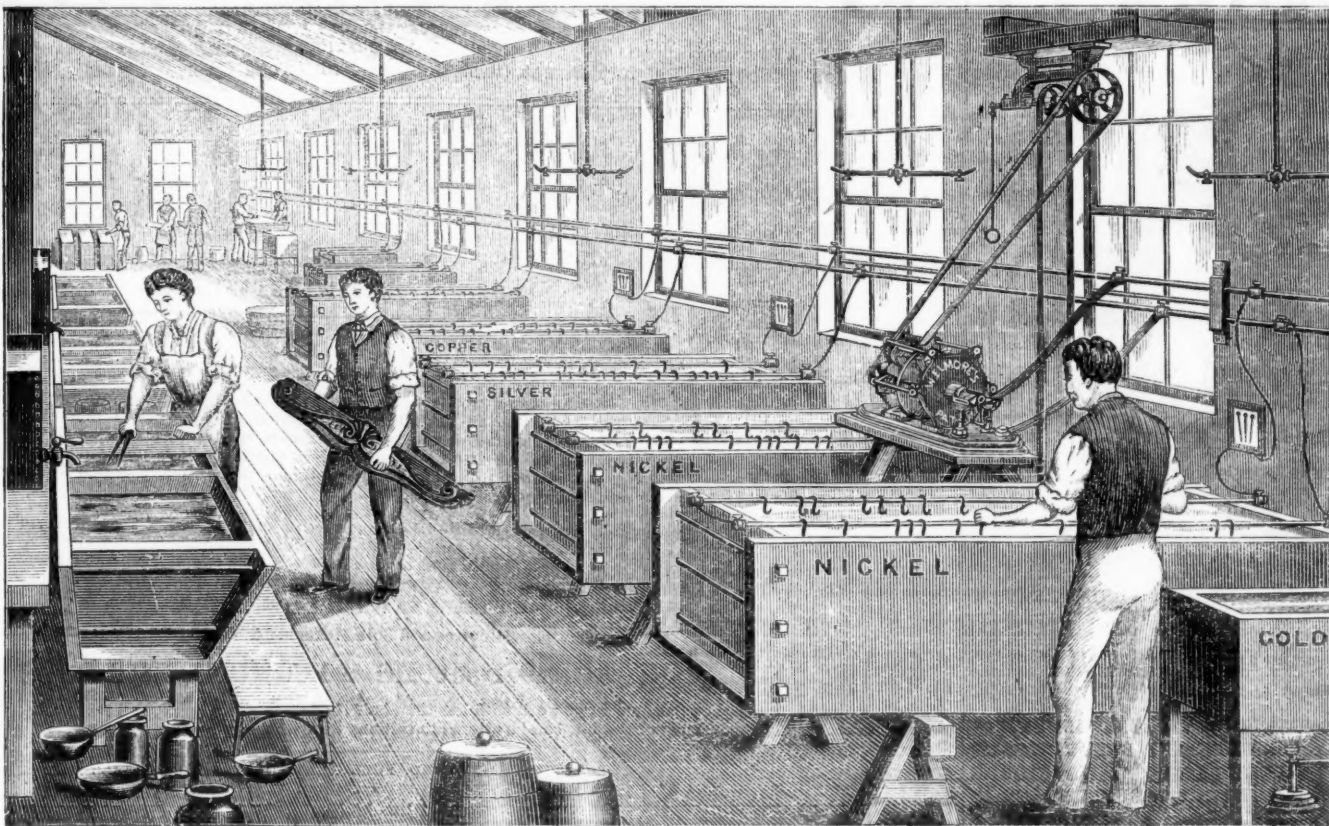
### TO TIN-PLATE MANUFACTURERS AND GALVANIZERS.

The attention of TIN-PLATE MANUFACTURERS AND GALVANIZERS is respectfully directed to the NEW PROCESSES of manufacturing Tin-Plates by depositing the Metal by the current of an "ELMORE'S PATENT" DYNAMO-ELECTRIC MACHINE through aqueous solutions in contradistinction to the old processes of dipping in molten metal.

THE ELECTRO DEPOSITED METAL IS PERFECTLY REGULAR IN character, and the electric current may be so EASILY CONTROLLED as to coat with a MERE FILM OF METAL, OR A DEPOSIT OF ANY DESIRED THICKNESS. The great economy in the cost of plant and cost of production will be immediately self-evident. As nearly the whole of the existing plant can be used in the new process, the cost of altering the system will be comparatively trifling.

DYNAMO-ELECTRIC MACHINES

SPECIALLY CONSTRUCTED FOR DEPOSITING ANY METAL IN ANY QUANTITY.



The above represents an Electro-plating Works, in which an "ELMORE" PATENT DYNAMO-ELECTRIC MACHINE is being used for the deposition of Nickel, Silver, Copper, Bronze, Brass, Gold, Tin, Zinc, &c., from their Solutions.

#### From "INDUSTRY."

"By means of the dynamo-electric machine of Mr. William Elmore, the perfection of nickel-plating is obtained. Dynamo-electricity—that is, electricity produced by motive power—presents advantages which cannot be claimed by any galvanic battery known. Not only is the current produced at a far less cost, but it can be so regulated or controlled that the smallest article can be separately coated by a dynamo-electric machine, capable (in its full application) of depositing from 25 lbs. to 30 lbs. of silver per hour. It is a remarkable fact, moreover, that metals can be deposited from their solutions by dynamo-electricity in less than one-third of the time occupied by the ordinary battery in producing the same result. The quality of the deposit, in regard to its smoothness and regular character, is greatly in favour of dynamo-electricity.

Having had considerable experience in dynamo-electric machines, Mr. W. Elmore has been careful to note the defects and irregularities which some of the less skilfully constructed machines have presented, and thus he has been enabled to produce a really practical and effective machine, of great power, which may be thoroughly depended upon as being capable of giving the most satisfactory results for all purposes of electro-deposition, including gilding, silvering, brassing, nickeling, and electrotyping.

"The advantages of dynamo-electricity in the important art of electrotyping are beyond estimation. When it is known that a fine, clear, deposit (or 'shell') of copper, 800 ft. square feet, can be obtained by a dynamo-machine in less than three hours, without 'pin-holes,' and other defects common to battery deposits, it will be at once seen that the ordinary battery is effectually and unmistakably superseded.

"One of the most useful purposes to which dynamo-electricity can be applied is the production of chemically pure nickel solutions, and salts of nickel, for the electro-deposition of the metal. The vast amount of elec-

tricity generated in a dynamo-machine enables one to dissolve nickel and other metals in their own solvents, far more economically, and in greater purity than by the ordinary method of treating metals. Electrical power obtained by the ordinary galvanic battery would be far too expensive for this purpose. The solutions formed by the aid of dynamo-electricity are not only purely and economically made; but they can be produced in far less time, and with comparatively little trouble and attention. To Mr. Elmore is due the honour of having introduced into this country the process of making pure nickel solutions and salts by means of dynamo-electricity. The boon he has thus conferred upon a large industrial class we need not dilate upon."

#### From "THE IRONMONGER."

"A still further improvement in the deposition of metals has been recently obtained by the introduction of the dynamo-electric machine of Mr. Wm. Elmore, which is in reality electricity produced by motive power. By this means the current is obtained at a much less cost, and I have seen it regulated to such a nicety that the smallest article could be separately coated in a full-sized vat. The deposit is also effected in about one-third of the time taken by a galvanic battery, and for smoothness and regularity of surface is greatly in favour of the dynamo process, which may be known from the fact that all Mr. Elmore's competitors, both in London and elsewhere, are fast adopting his machine in preference to the old process. He has, in addition, supplied it to many large firms throughout the country for electrotyping purposes, and the reports received from them are gratifying to the inventor. Mr. Elmore is also the author of an interesting little work on the subject, which may be read with interest by those who contemplate entering into what is fast becoming an important industry."

## WILLIAM ELMORE, 91, BLACKFRIARS ROAD, LONDON, S.E.

DYNAMO-ELECTRIC MACHINES FOR ELECTRIC LIGHTING.

DYNAMO-ELECTRIC MACHINES SPECIALLY CONSTRUCTED FOR DECOMPOSITION.

DYNAMO-ELECTRIC MACHINES FOR DEPOSITING ANY METAL IN ANY QUANTITY.



**WILLIAM BENNETTS.**

PATENT MINERS'  
**SAFETY FUSE**  
MANUFACTURER.

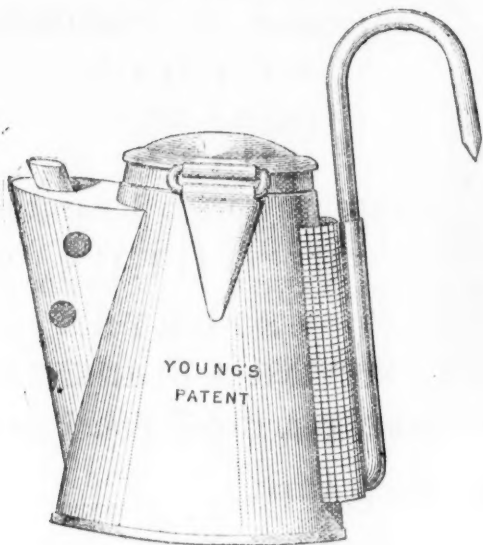


This manufacture embraces all the latest improvements for use in Blasting in Mines, Quarries, or for Submarine Purposes; and is adapted for exploding Gunpowder, Dynamite, or any other Explosive; and is made suitable for exportation to any part of the world Price Lists and Sample Cards on application.

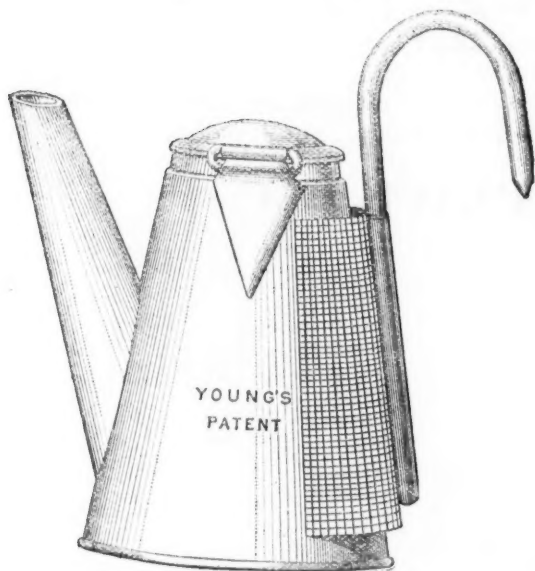
All communications to be addressed—

**ROSKEAR FUSE WORKS,**  
CAMBORNE, CORNWALL.

**YOUNG'S PARAFFIN LIGHT AND  
MINERAL OIL COMPANY**  
(LIMITED)



No. 301.—Miners or Getters' Lamp. Full size.



No. 303.—Drawers' or Putters' Lamp. Full size.

**MINERS' LAMPS FOR BURNING SOLID  
PARAFFIN WAX.**

YOUNG'S PARAFFIN LIGHT AND MINERAL OIL COMPANY (Limited) have pleasure in inviting attention to their recently-patented MINERS' LAMPS for BURNING SOLID PARAFFIN WAX, which possess great advantages over all underground lamps used either with oil or tallow. Many miners have tested them, and report in the highest terms as to the whiteness, smokelessness, safety, and great economy of their light in comparison with that obtained from other underground lamps.

AN EXPERIENCED OVERSEER ESTIMATES THE SAVING TO EACH MINER AT 3d. PER WEEK, AND SAYS THE LAMP GIVES NEARLY TWICE AS MUCH LIGHT AS WHEN ORDINARY TALLOW IS USED, WITH NO TROUBLE IN TRIMMING.

MANUFACTURED BY  
**YOUNG'S PARAFFIN LIGHT AND MINERAL  
OIL COMPANY (LIMITED),**

At their

**CLISSOLD LAMP WORKS, BIRMINGHAM,**

And supplied to the trade from their

WHOLESALE BRANCHES AT ABERDEEN, BELFAST, BRISTOL, DUBLIN  
DUNDEE, EDINBURGH, GLASGOW, HULL, LONDON, MAN-  
CHESTER, NEWCASTLE-ON-TYNE, AND PLYMOUTH.

JOHN FYFE, General Manager.

REGISTERED OFFICE,—7, WEST GEORGE STREET, GLASGOW.

MINING ENGINEER.

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Mining Engineer, late Director of the United States Bureau of Statistics, Mining Commissioner for the United States Monetary Commission, &c., 216, SANSOME STREET, SAN FRANCISCO: Cable address—"Delmar, San Francisco." Branch Office, 61, Broadway, New York: Cable address—"Delmar, New York." London Agency, H. Stokes and Co., 24A, Southwark-street, S.E.: Cable address—"Delmar, London." Paris Agency, J. H. McDonald and Co., 13, Rue St. Lazare: Cable address—"Delmar, Paris."

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ESTABLISHED 1852.  
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**CANNON STEEL WORKS, SHEFFIELD.**

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MELBOURNE—1881.



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"EXCELLENCE OF MANUFACTURE."

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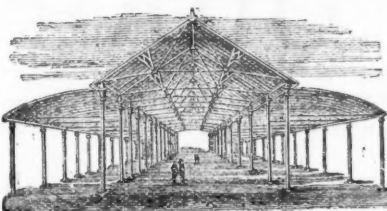
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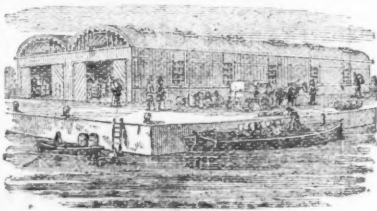
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GALVANISED OR PAINTED CORRUGATED IRON ROOFING PLATES and TILES. HEAVY CORRUGATED IRON PLATES for fireproof floors, roadways, parapets, &c. (for producing which F.M. and Co. have recently laid down powerful Hydraulic Machinery). Wrought-iron Tanks, Gutters, and General Constructional Wrought Ironwork.

DESIGNS PREPARED, AND ILLUSTRATED DESCRIPTIVE CATALOGUES FORWARDED ON APPLICATION.



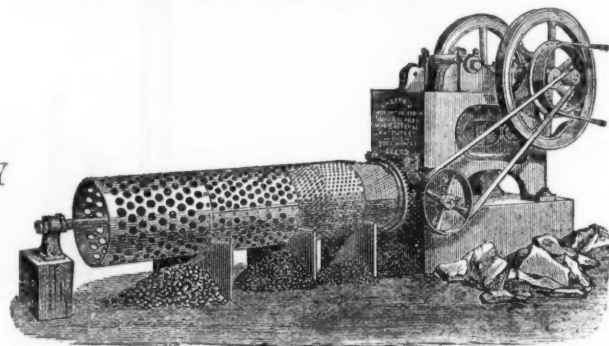
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**STONE BREAKERS.**

**12 BY 8**

AS SUPPLIED TO THE DERBY  
CORPORATION.



**W. H. BAXTER AND CO.,**

Patentees and Sole Makers of the

**Only Knapping Motion Stone Breakers and Ore Crushers.**

These Machines turn out the same amount of work with less than half the power of any other, and make a better sample of Road Metal, with less waste. The movement of the Jaw can be altered to suit any kind of material, an advantage possessed by no other machine.

FOR TESTIMONIALS AND FULL PARTICULARS ADDRESS—

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SEVERAL OF THESE MACHINES ARE NOW IN OPERATION.

**GALVANIZED IRON BUILDINGS AND IRON ROOFING.**

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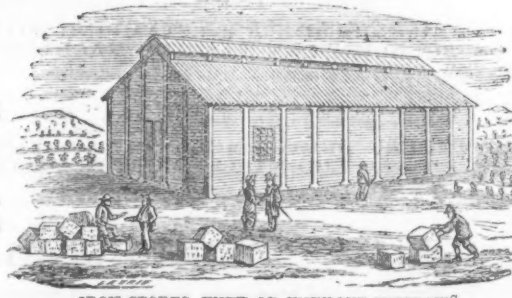
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N.B.—Messrs. HEMMING AND CO. have a SPECIALITY of CONSTRUCTION OF IRON BUILDINGS FOR THE INDIAN GOLD FIELDS. Established 1851.

**WORKS,—OLD FORD, LONDON.**



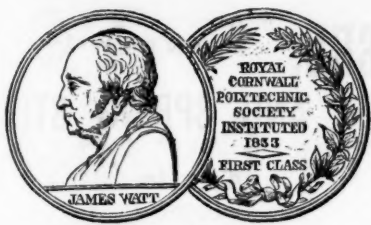
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# SANDYCROFT FOUNDRY AND ENGINE-WORKS CO. (LIMITED), CHESTER.

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ESTABLISHED 1838.



PUMPING &amp; WINDING ENGINES.

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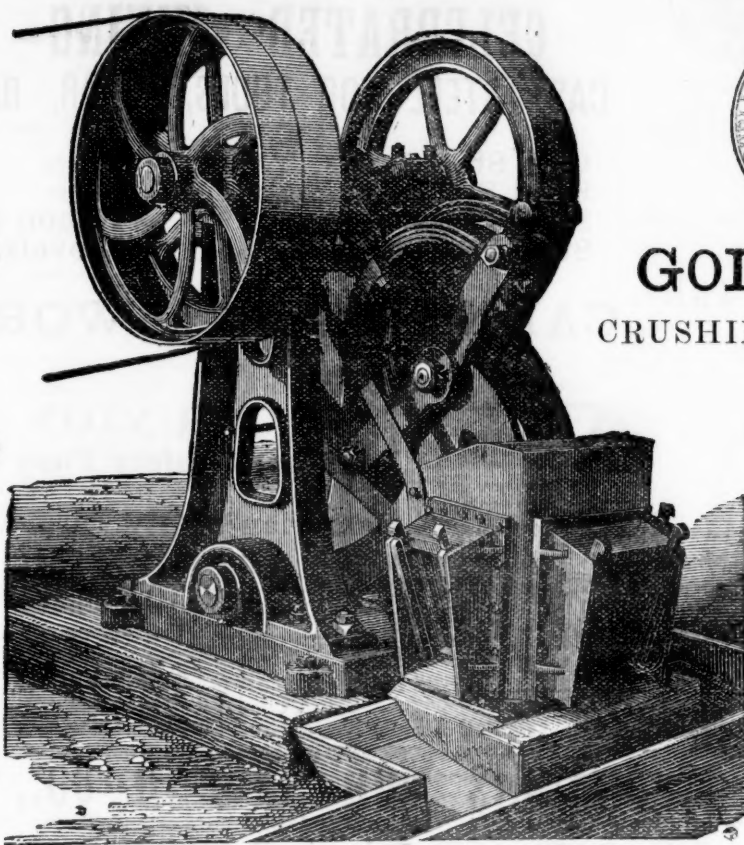
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AND STORES OF ALL KINDS.



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CRUSHING AND AMALGAMATING MACHINERY.

Californian or Gravitation

STAMPS

OF ANY SIZE OR PATTERN

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Concentrators &amp; Separators.

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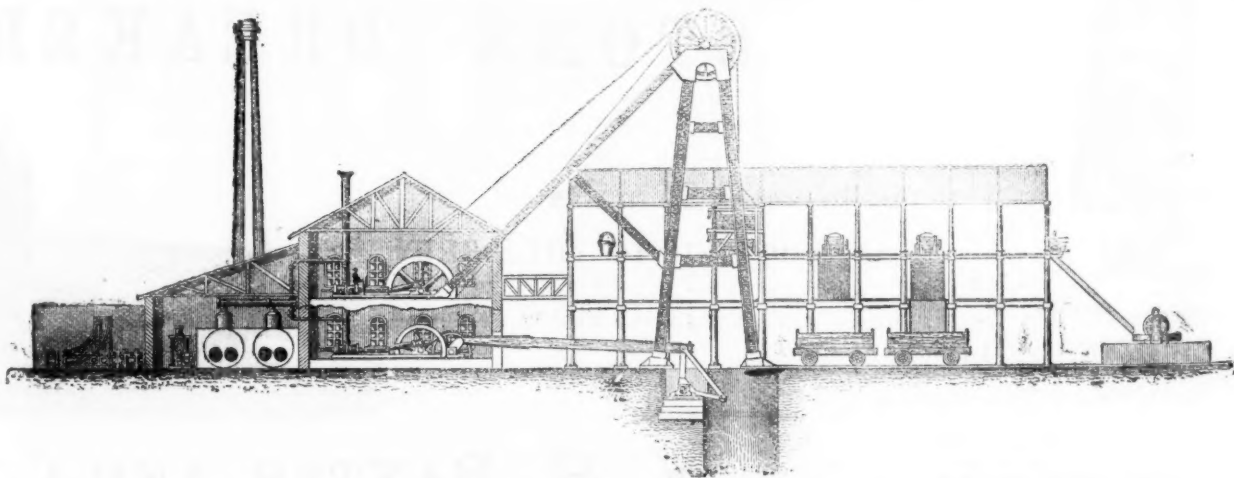
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# GOLD QUARTZ,

And other hard and refractory Materials. Particularly designed and adapted for transmission Abroad, and for Countries where Transport is a difficulty. Quickly and economically erected. Can be seen stamping Quartz near London.

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### BRICKWORKS.

PATENT BRICK MACHINES for DRY, SEMI-DRY, and PLASTIC CLAY; WET and PERFORATED CLAY GRINDING PANS; CLAY ROLLS; PUG MILLS; MORTAR MILLS; FRICTION HOISTS; PIPE-MAKING MACHINES; BRICK PRESSES; PATENT KILNS.

PLANS, SPECIFICATIONS, AND ESTIMATES FOR COMPLETE PLANTS ON APPLICATION.

BEST DESIGNS, WORKMANSHIP, and MATERIAL THROUGHOUT.

N.B.—Experienced workmen sent out, if required, to Erect or Manage. Considerable Saving in Prices by dealing direct with us, having for many years been chiefly engaged in the manufacture of Colliery, Mining, and Brickmaking Plants.



## THE GRAND PRIZE, THE TRIPLE AWARD.

Gold Medal, Silver Medal, and Honourable Mention awarded at the Paris Exhibition, in competition with all the World,  
FOR MY LATEST PATENTED STONE BREAKERS AND ORE CRUSHERS.

HIGHEST AWARDS  
FROM THE  
MINING INSTITUTE  
OF CORNWALL.

# H. R. MARSDEN,

ORIGINAL PATENTEE AND SOLE MAKER OF BLAKE-MARSDEN

PULVERISERS,  
B O N E M I L L S  
MORTAR MILLS  
&c. &c.

## Improved Patent Stone Breakers & Ore Crushers.

New Patent Reversible Jaws,  
in Sections with Patent  
Faced Backs.

NEW PATENT ADJUSTABLE  
TOGGLES.

OVER 2750 IN USE.

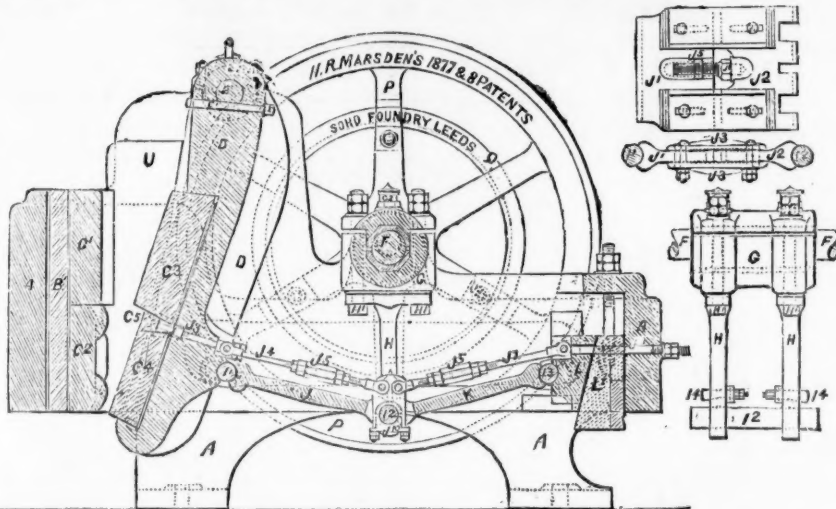
NEW PATENT WROUGHT-IRON CONNECTING  
ROD.

New Patent Draw-back  
Motion.

NEW PATENT STEEL TOGGLE BEARINGS.

60

PRIZE MEDALS.



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DEAR SIR,—We have adopted your Stone Breakers at  
many of the mines under our management, and are  
pleased to be able to state that they have in all cases  
given the greatest satisfaction.

We are, yours faithfully,  
JOHN TAYLOR AND SONS,  
H. R. Marsden, Esq.,  
Soho Foundry, Meadow-lane, Leeds.

St. John del Rey Mining Company (Limited).  
A SAVING OF FIFTY-FIVE HANDS BY THE USE OF  
ONE MEDIUM-SIZED MACHINE.

BLAKE'S STONE BREAKER.—Statement made by the Managing Director of the St. John del Rey Mining Company, Mr. John Hockin, with regard to six months' practical working of Blake's Stone Breaker, affording facility for judging of the relative economy of machine and hand labour in this kind of work, and also of the cost of getting the Stone Breaker to work in difficult places. The price paid to Mr. Marsden for the machine referred to by Mr. Hockin was £180, and adding to this the cost of engine carriage, and fixing, the aggregate cost to the company of the Breaker in working order was £500. By this outlay the company is enabled to dispense with the labour of 50 people, the value of which is £800 per annum. The cost of working the machine could not be more than the wages of about five men (the machine requires but one man to feed it, so that the rest would be for engineer, fuel, oil, &c.), and allowing for interest on outlay and for renewal when necessary, the saving must be enormous.—Mining Journal.

ALL BEARINGS are renewable, and made of H.R.M.'s Patent Compound ANTIFRICTION METAL.

CATALOGUES, TESTIMONIALS, &c.

H. R. MARSDEN, SOHO FOUNDRY, LEEDS.

Patentee of the New Patent Special Fine Crusher, for reducing Gold Quartz, Lead Ore, and all kinds of Materials to an impalpable powder. Awarded the FIRST SILVER MEDAL by the Cornwall Mining Institute. Particulars of results, &c., on application.

## JOHN CAMERON'S

FLY-WHEELS ON BOTH SIDES.

SPECIALITIES ARE HIS

### STEAM PUMPS

FOR

### COLLIERY PURPOSES,

Specially adapted for forcing Water any height;

ALSO, FOR

### SINKING, FEEDING BOILERS AND STEAM FIRE ENGINES,

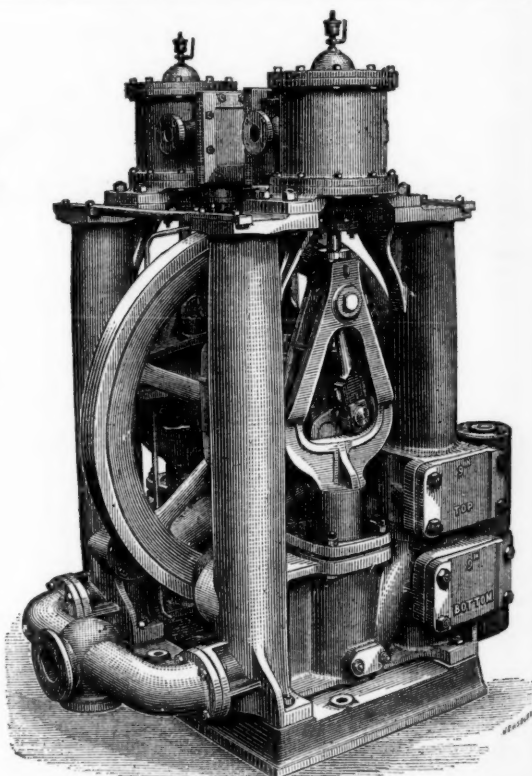
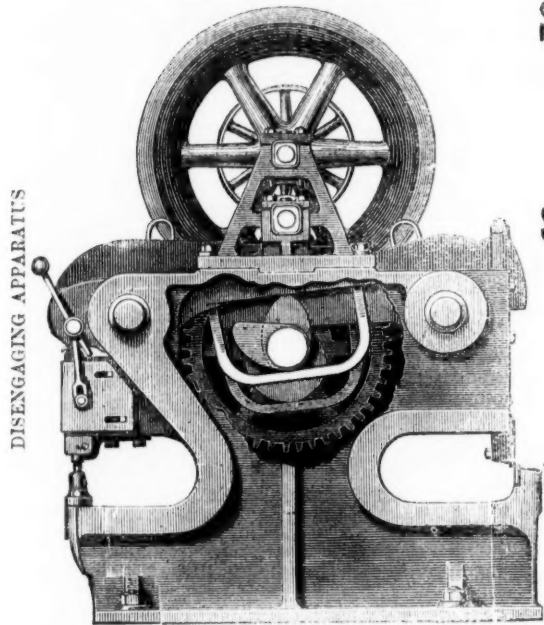
Of which he has made over 8000.

ALSO, HIS

PATENT CAM AND LEVER

PUNCHING AND SHEARING MACHINES.

Works: Oldfield Road, Salford,  
Manchester.



MAPS OF THE MINES, AND OF UTAH TERRITORY

FROISETH'S NEW AND REVISED MAP FOR 1875.—Size 40 by 56 inches, scale 8 miles to the inch. Handsomely engraved, coloured in counties, showing the Towns, Settlements, Rivers, Lakes, Railroads, Mining Districts, &c., throughout the Territory, and all the Government Surveys to date. Mounted on cloth, £2; half-mounted, £1 12s.; pocket form, £1.

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Also, NEW MAP OF LITTLE AND BIG COTTONWOOD MINING DISTRICTS showing the location of over Four Hundred Mines and Tunnel Sites, together with the Mines Surveyed for United States Patent. Price, sheets, 6s.; pocket form, 8s.

For sale, and supplied by—  
TRUBNER and Co., 57 and 59 Ludgate Hill, London.  
B. A. M. FROISETH, Salt Lake City, Utah, U.S.

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HOPKIN'S CONVERSATIONS ON MINES, between Father and Son. The additions to the work are near 80 pages of useful information, principally questions and answers, with a view to assist applicants intending to pass an examination as mine managers, together with tables, rules of measurement, and other information on the moving and propelling power of ventilation, a subject which has caused so much controversy.

The following few testimonials, out of hundreds in Mr. Hopkin's possession, speak to the value of the work:—  
"The book cannot fail to be well received by all connected with collieries."—Mining Journal.

"The contents are really valuable to the miners of this country."—Miners' Conference.

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London: MINING JOURNAL Office, 26 Fleet-street, E.C., and to be had of all booksellers.

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MINE AND QUARRY STANDS, STEEL DRILLS, SPECIALLY PREPARED INDIAN RUBBER HOSE, TESTED IRON PIPES, &c.

### Air-Compressing Machinery,

Simple, strong, and giving most excellent results, and

### ELECTRIC BLASTING APPARATUS.

Full particulars of rapid and economical work effected  
by this machinery, on application.

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Mechanical and Consulting Engineers,

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(WORKS AND OFFICES ADJOINING CRADLEY STATION),

Manufacturers of

### CRANE, INCLINE, AND PIT CHAINS.

Also CHAIN CABLES, ANCHORS, and RIGGING CHAINS, IRON and STEEL SHOVELS, SPADES, FORKS, ANVILS, VICES, SCYTHES, HAY and CHAFF KNIVES, PICKS, HAMMERS, NAILS, RAILWAY and MINING TOOLS, FRYING PANS, BOWLS, LADLES, &c., &c.

Crab Winches, Pulley and Snatch Blocks, Screw and Lifting Jacks, Ship Knees, Forgings, and Use Iron of all descriptions

### WELDED STEEL CHAINS

FOR CRANES, INCLINES, MINES, &c.,  
MADE ALL SIZES.